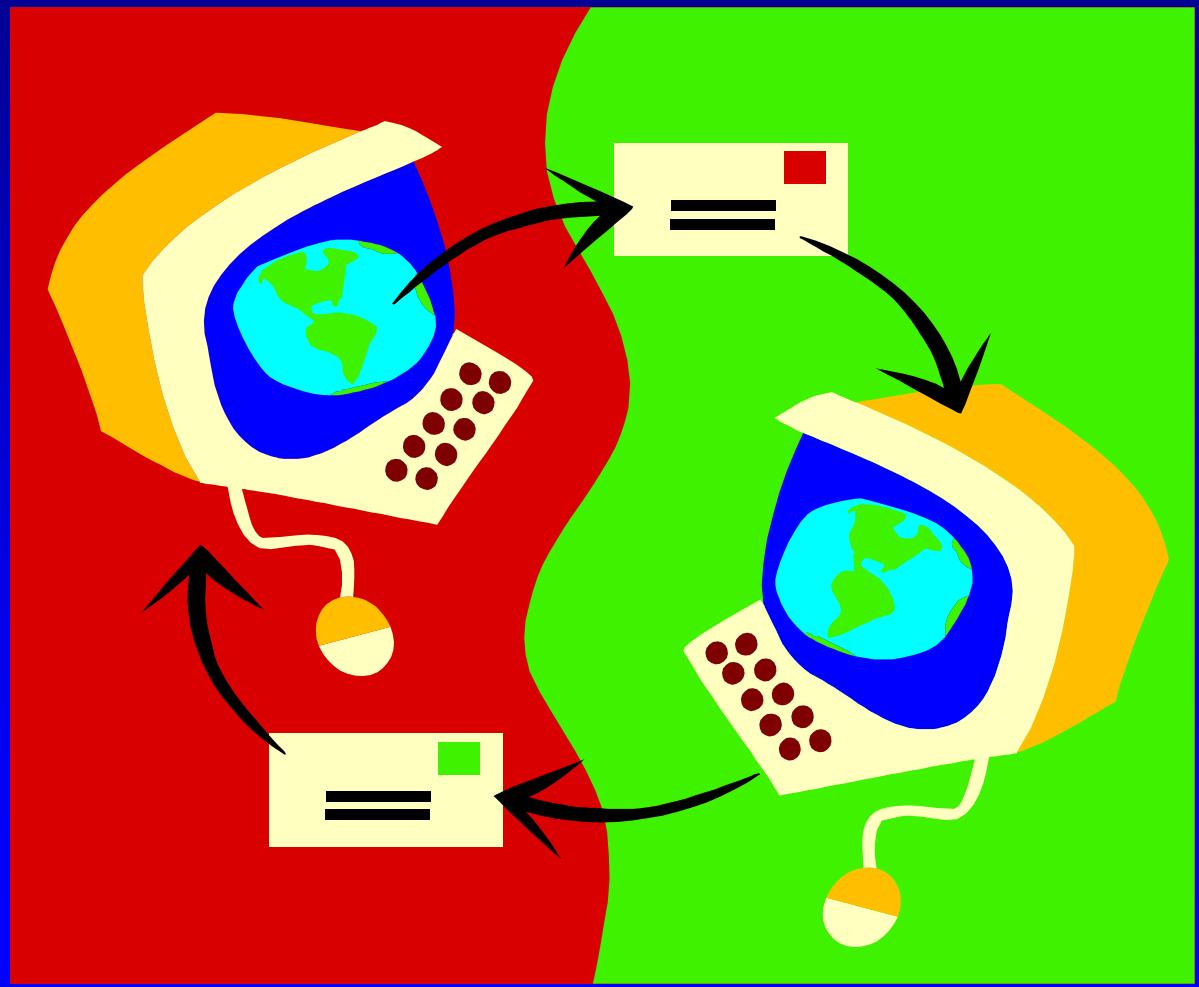
Training Public Health and Healthcare Partners to Use Electronic Reportable Disease Systems – New Jersey's Experiences, 2001 - Present

Marlene Bednarczyk, MSQSM

New Jersey's Public Health Structure

- Population of approximately 8 million
- 566 municipalities in 21 counties under 114 local health departments
- 81 acute care hospitals
- Approximately 20,000 private physicians
- Local Information Network and Communications System (LINCS) has 22 sites plus 22 epidemiologists
- Report according to NJAC 8:57 and CDC

A Quick Overview of the CDRS



First, the System

- Communicable Disease Reporting System (CDRS) of New Jersey
- 2001 - Office of Information Technology Services (OITS) and Division of Epidemiology, Environmental and Occupational Health enter partnership to develop and implement the CDRS at the state

CDRS Structure

- Built in-house, based on NEDSS/PHIN architecture
- Secure site - SSL
- Web-enabled
- Internet Explorer browser based
- Electronic reporting system
- Accessible 24 hours per day, 7 days per week

CDRS Software

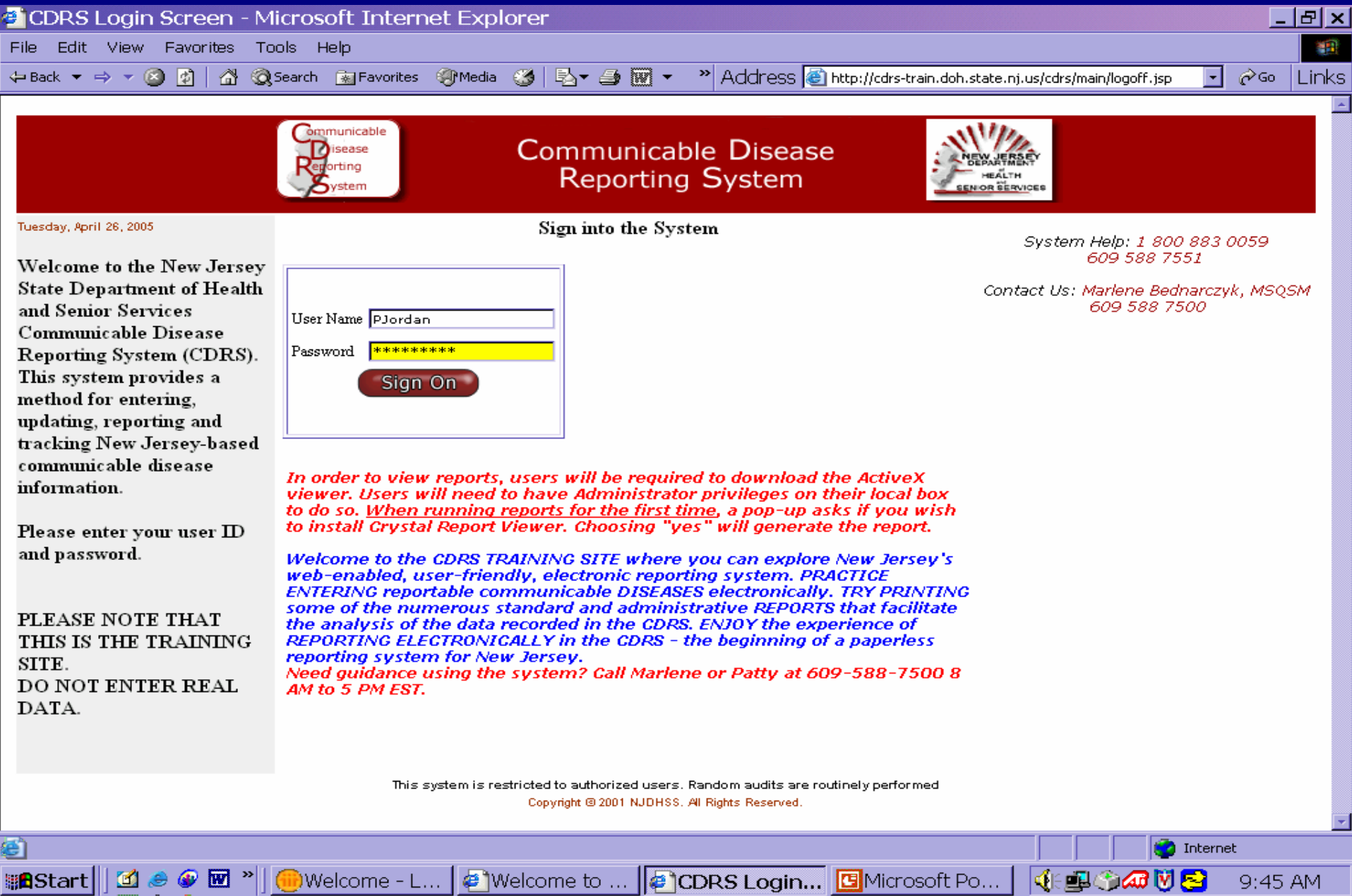
- Java
- JavaScript
- Oracle 9i
- HL7
- ebXML
- Crystal Reports
- No custom client software required
- ArcIMS for GIS/Routeserver for geocoding
- WebLogic
- VPN for data exchange
- Microsoft IIS
- Windows 2000 platform

Multiple sites

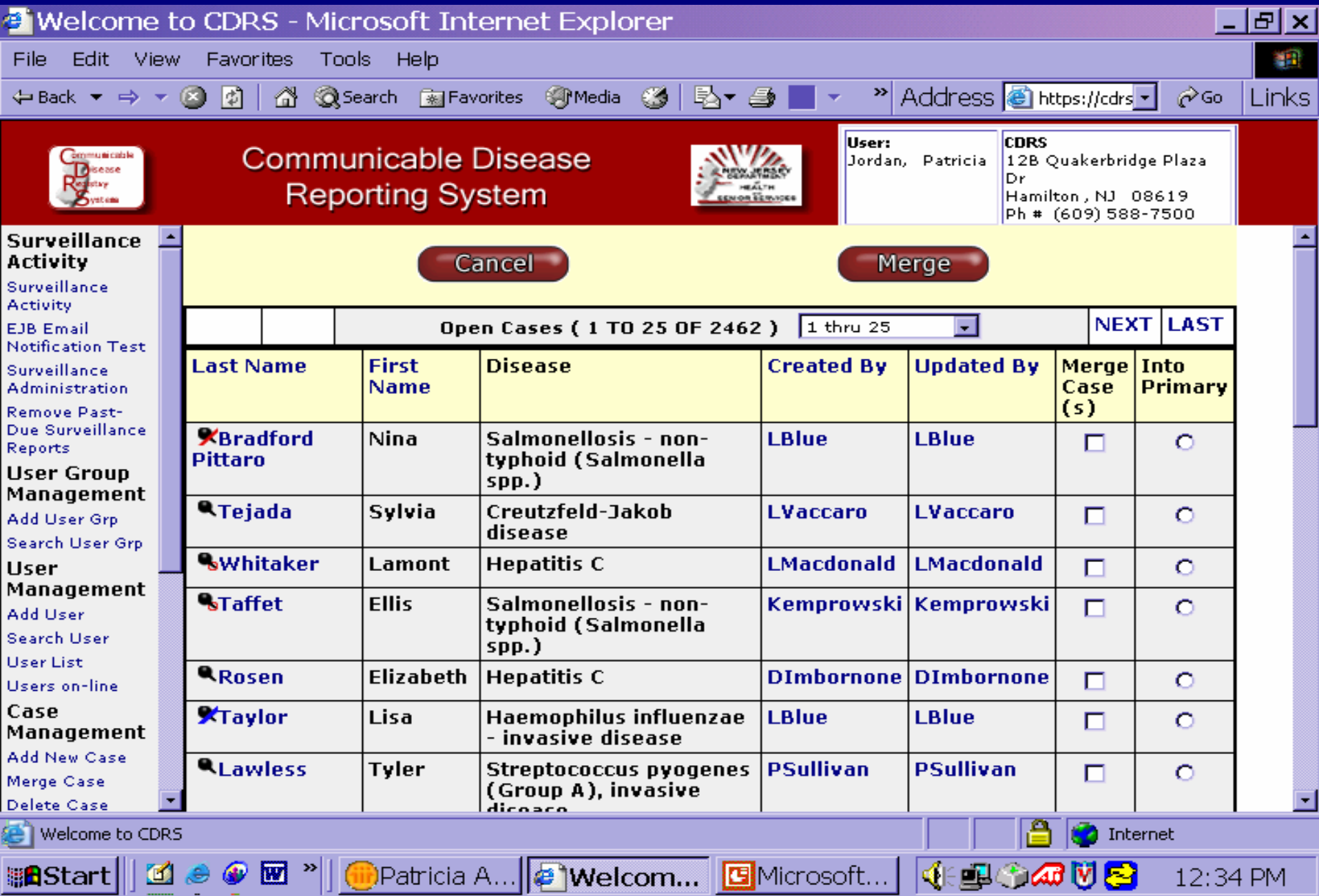
- CDRS production site – secure
  https://cdrs.doh.state.nj.us
- CDRS training site – not secure
  http://cdrs-train.doh.state.nj.us
- CDRS and CDRSS (next phase) test sites behind firewall – not accessible offsite

Examples of Data Entry Screens in the CDRS Training Site Containing Dummy Data

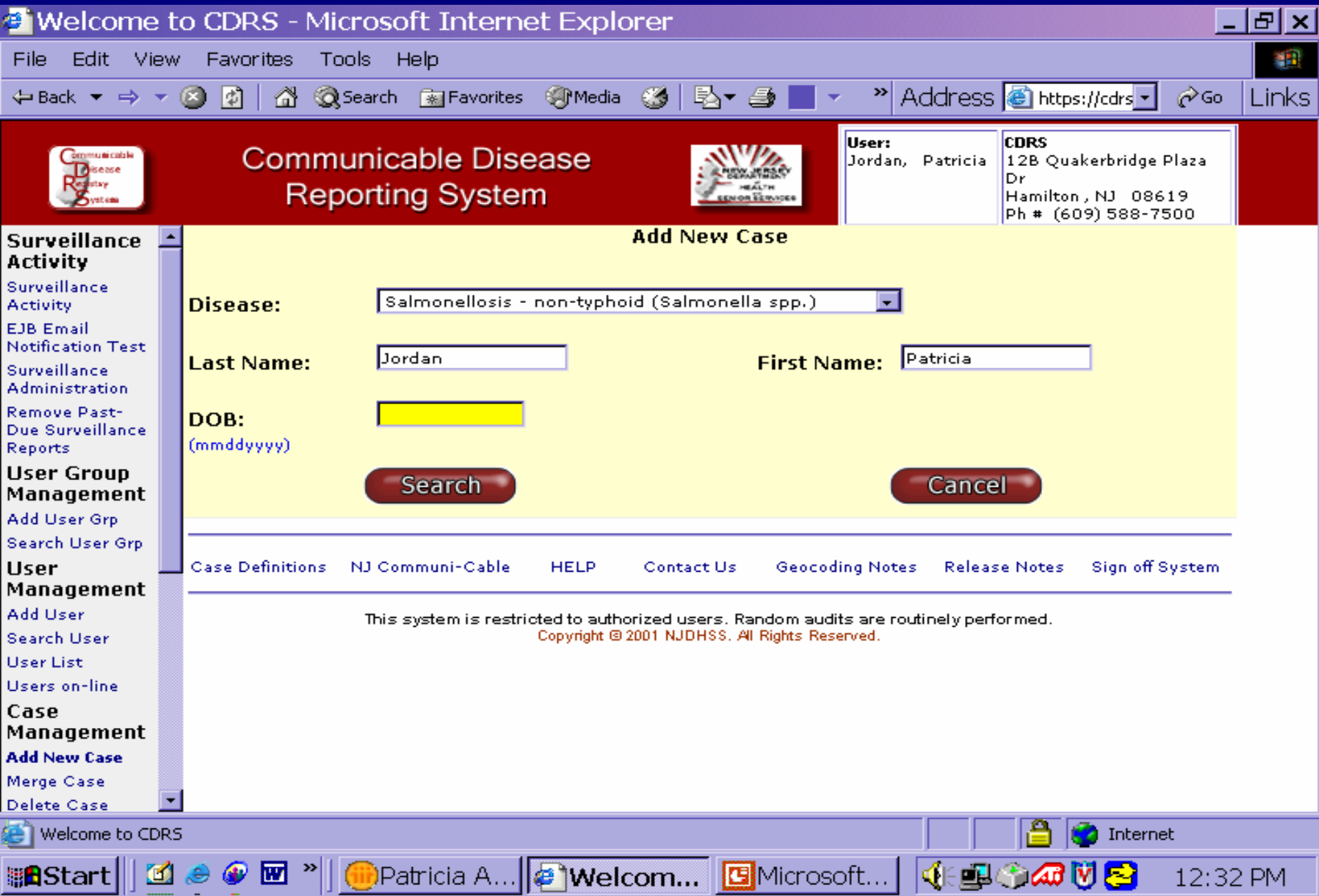
Log In Screen



Open Cases


Welcome to CDRS - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media Address https://cdrs Go Links
Communicable Disease Reporting System
User: Jordan, Patricia
CDRS 12B Quakerbridge Plaza Dr Hamilton , NJ 08619 Ph # (609) 588-7500
Surveillance Activity
Surveillance Activity
EJB Email Notification Test
Surveillance Administration
Remove Past-Due Surveillance Reports
User Group Management
Add User Grp
Search User Grp
User Management
Add User
Search User
User List
Users on-line
Case Management
Add New Case
Merge Case
Delete Case
Cancel
Merge
Open Cases (1 TO 25 OF 2462)
1 thru 25
NEXT
LAST
Last Name
First Name
Disease
Created By
Updated By
Merge Case (s)
Into Primary
Bradford Pittaro
Nina
Salmonellosis - non-typhoid (Salmonella spp.)
LBlue
LBlue
Tejada
Sylvia
Creutzfeld-Jakob disease
LVaccaro
LVaccaro
Whitaker
Lamont
Hepatitis C
LMacdonald
LMacdonald
Taffet
Ellis
Salmonellosis - non-typhoid (Salmonella spp.)
Kemprowski
Kemprowski
Rosen
Elizabeth
Hepatitis C
DImbornone
DImbornone
Taylor
Lisa
Haemophilus influenzae - invasive disease
LBlue
LBlue
Lawless
Tyler
Streptococcus pyogenes (Group A), invasive
PSullivan
PSullivan
Welcome to CDRS
Internet
Start
Patricia A...
Welcom...
Microsoft...
12:34 PM

Add a Case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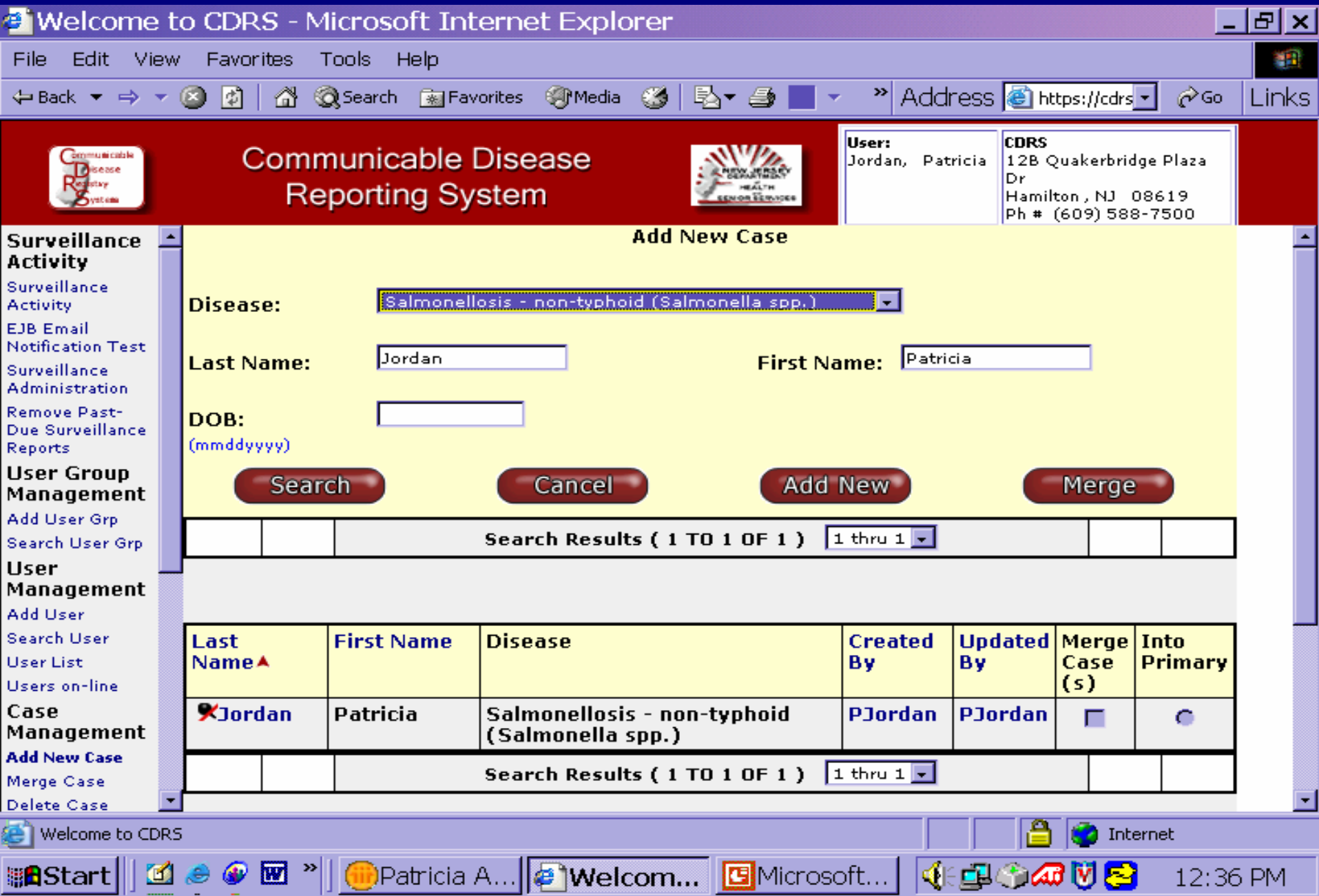
User List
Users on-line
Case Management
Add New Case
Merge Case
Delete Case
Add New Case
Disease:
Salmonellosis - non-typhoid (Salmonella spp.)
Last Name:
Jordan
First Name:
Patricia
DOB:
(mmddyyyy)
Search
Cancel
Case Definitions NJ Communi-Cable HELP Contact Us Geocoding Notes Release Notes Sign off System
This system is restricted to authorized users. Random audits are routinely performed.
Copyright © 2001 NJDHSS. All Rights Reserved.
Welcome to CDRS
Internet
Start
Patricia A...
Welcom...
Microsoft...
12:32 PM

Add New Case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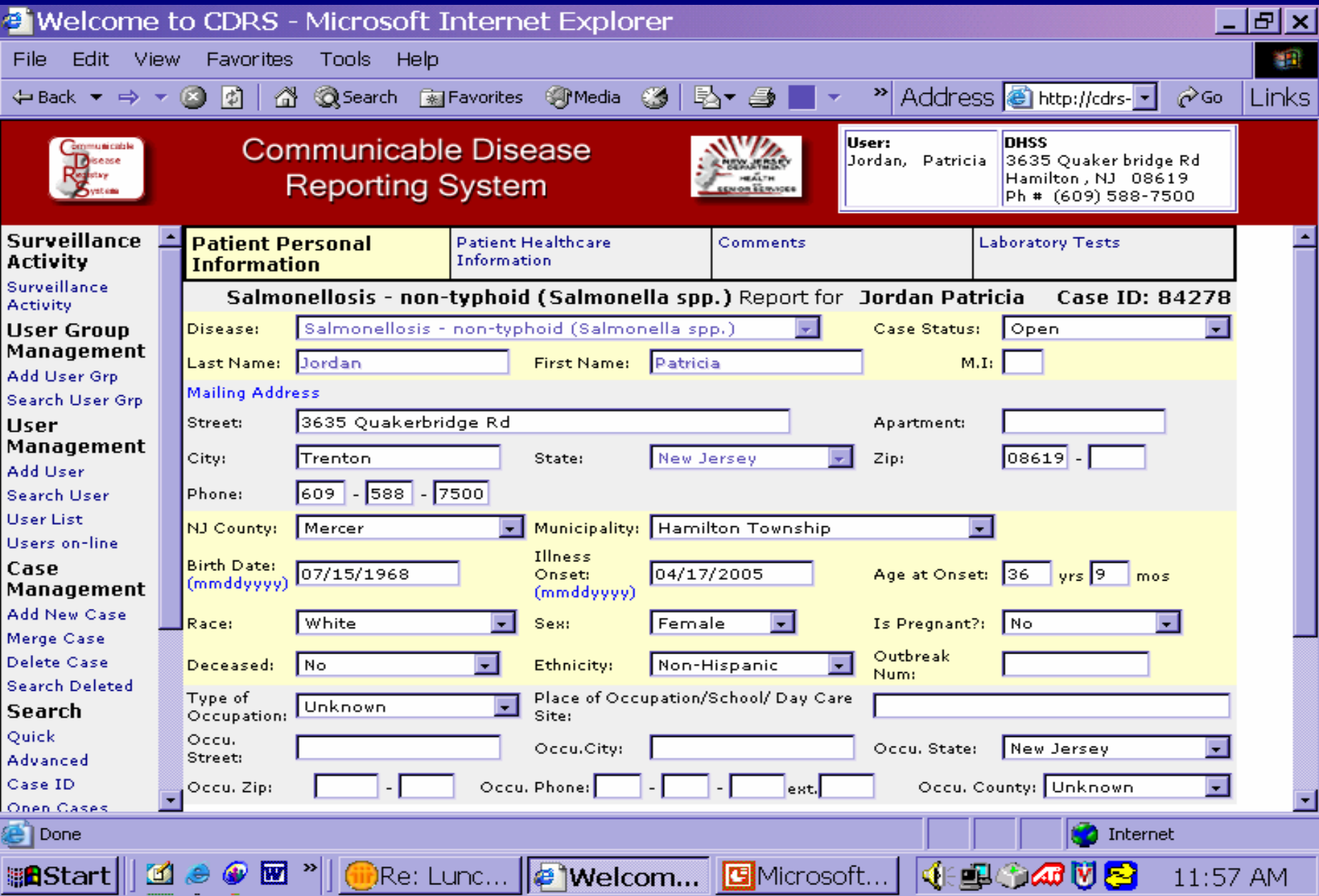
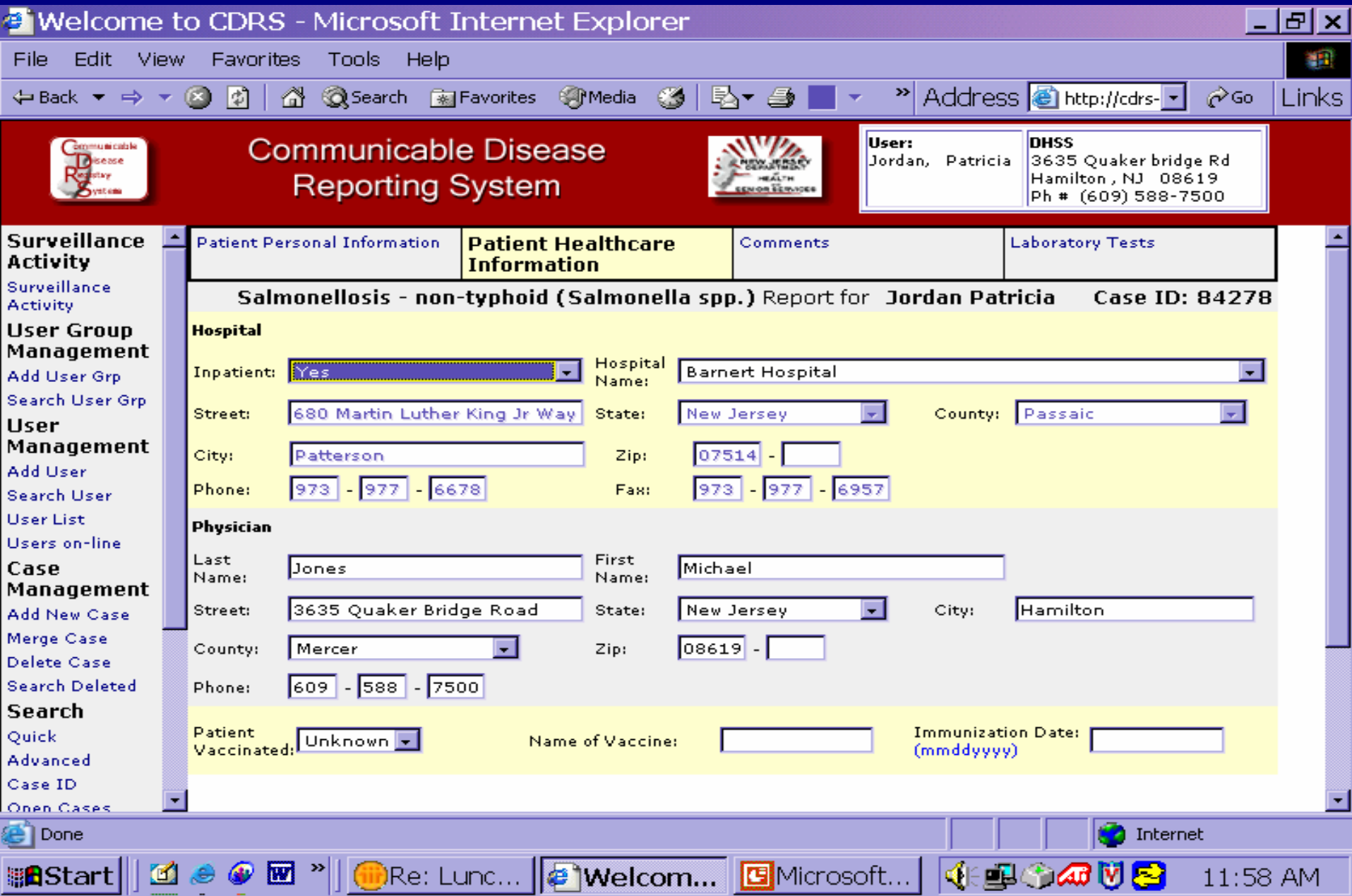
Search User
User List
Users on-line
Case Management
Add New Case
Merge Case
Delete Case
Add New Case
Disease: Salmonellosis - non-typhoid (Salmonella spp.)
Last Name: Jordan
First Name: Patricia
DOB:
(mmddyyyy)
Search Cancel Add New Merge
Search Results (1 TO 1 OF 1) 1 thru 1
Last Name First Name Disease Created By Updated By Merge Case (s) Into Primary
Jordan Patricia Salmonellosis - non-typhoid (Salmonella spp.) PJordan PJordan
Search Results (1 TO 1 OF 1) 1 thru 1
Welcome to CDRS
Internet
Start Patricia A... Welcom... Microsoft... 12:36 PM

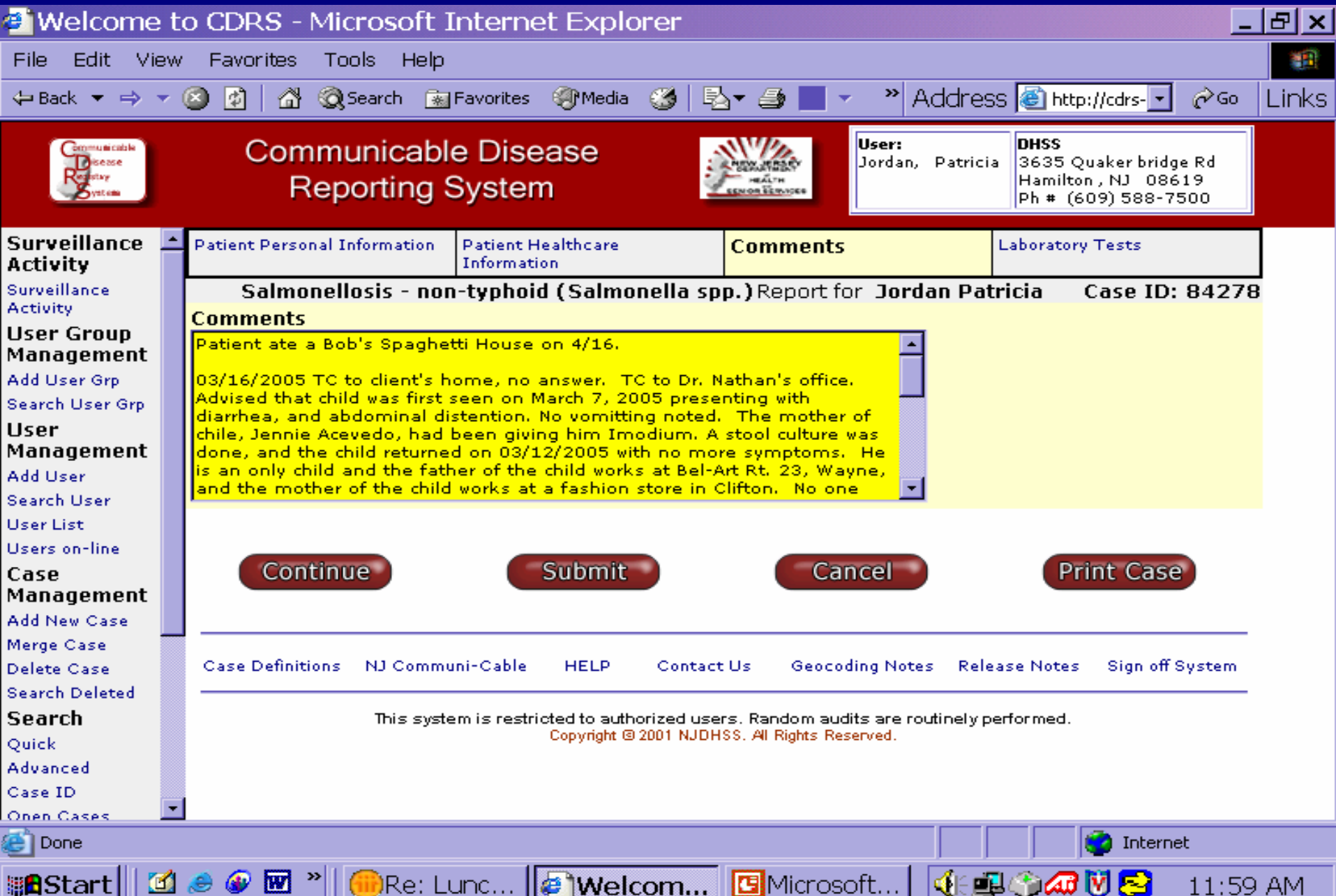
Patient Information



Patient Healthcare Information



Comments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User: Jordan, Patricia
DHSS 3635 Quaker bridge Rd Hamilton , NJ 08619 Ph # (609) 588-7500
Surveillance Activity
Surveillance Activity
User Group Management
Add User Grp
Search User Grp
User Management
Add User
Search User
User List
Users on-line
Case Management
Add New Case
Merge Case
Delete Case
Search Deleted
Search
Quick
Advanced
Case ID
Open Cases
Patient Personal Information
Patient Healthcare Information
Comments
Laboratory Tests
Salmonellosis - non-typhoid (Salmonella spp.) Report for Jordan Patricia Case ID: 84278
Comments
Patient ate a Bob's Spaghetti House on 4/16.
03/16/2005 TC to client's home, no answer. TC to Dr. Nathan's office. Advised that child was first seen on March 7, 2005 presenting with diarrhea, and abdominal distention. No vomitting noted. The mother of chile, Jennie Acevedo, had been giving him Imodium. A stool culture was done, and the child returned on 03/12/2005 with no more symptoms. He is an only child and the father of the child works at Bel-Art Rt. 23, Wayne, and the mother of the child works at a fashion store in Clifton. No one
Continue
Submit
Cancel
Print Case
Case Definitions NJ Communi-Cable HELP Contact Us Geocoding Notes Release Notes Sign off System
This system is restricted to authorized users. Random audits are routinely performed.
Copyright © 2001 NJDHSS. All Rights Reserved.
Done
Internet
Start
Re: Lunc...
Welcom...
Microsoft...
11:59 AM

Case Definition

Salmonellosis, (Salmonella sp. except typhi) - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Search Favorites Media

Address http://www.state.nj.us/health/cd/cd_salmon.htm Go Links

Surveillance Case Definition

Salmonellosis, (*Salmonella* spp. except typhi)

CLINICAL DESCRIPTION

An illness of variable severity commonly manifested by diarrhea, abdominal pain, nausea, and sometimes vomiting. Asymptomatic infections may occur and the organism may cause extraintestinal infections. The incubation period is from 6 to 72 hours, usually 12 to 36 hours.

CASE CLASSIFICATION

A. **CONFIRMED**
Isolation of *Salmonella* from a clinical specimen, regardless of symptoms (see Note).

B. **PROBABLE**

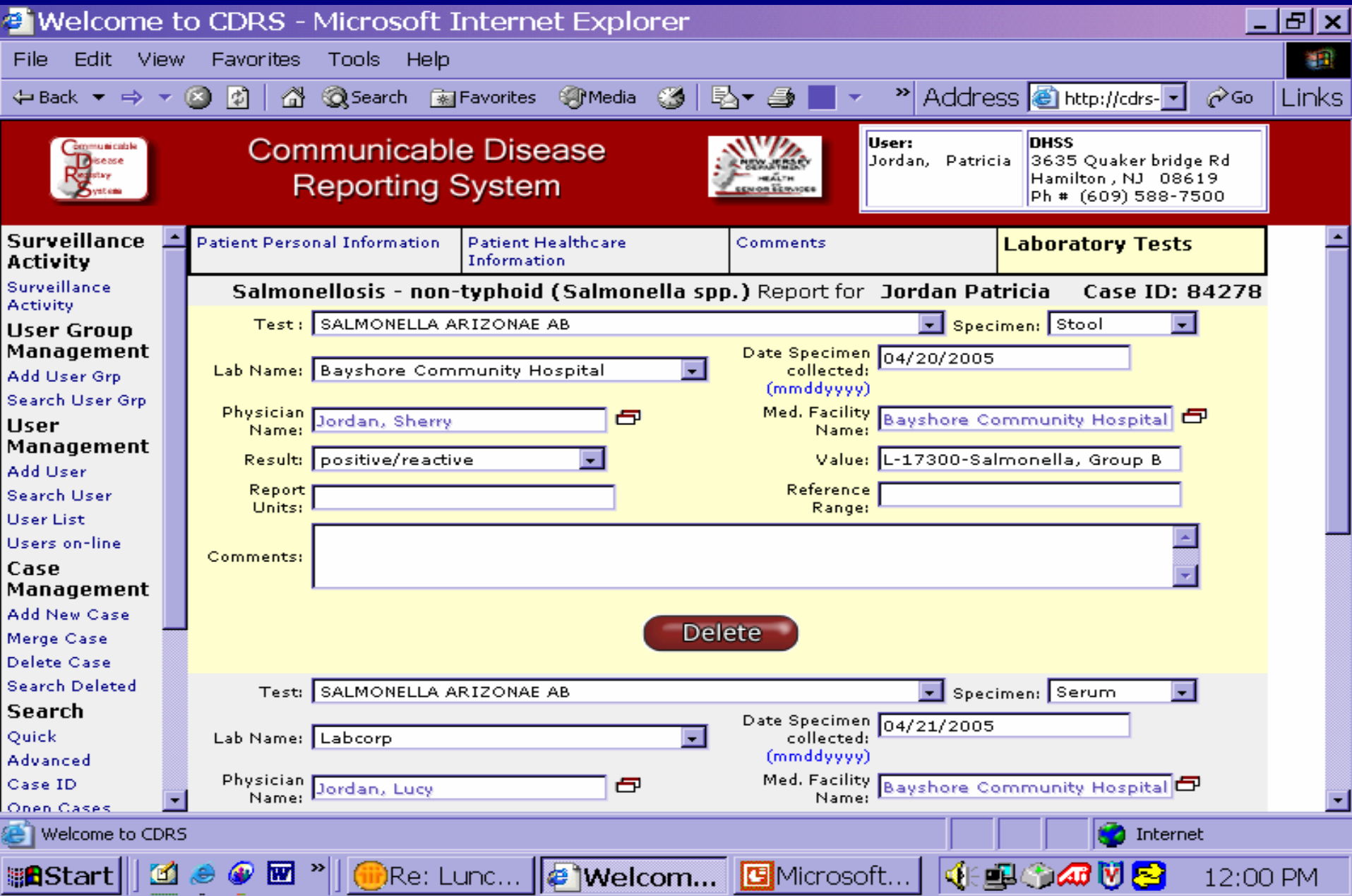
A clinically compatible case that is epidemiologically linked to a confirmed case.

C. **POSSIBLE**
Not used

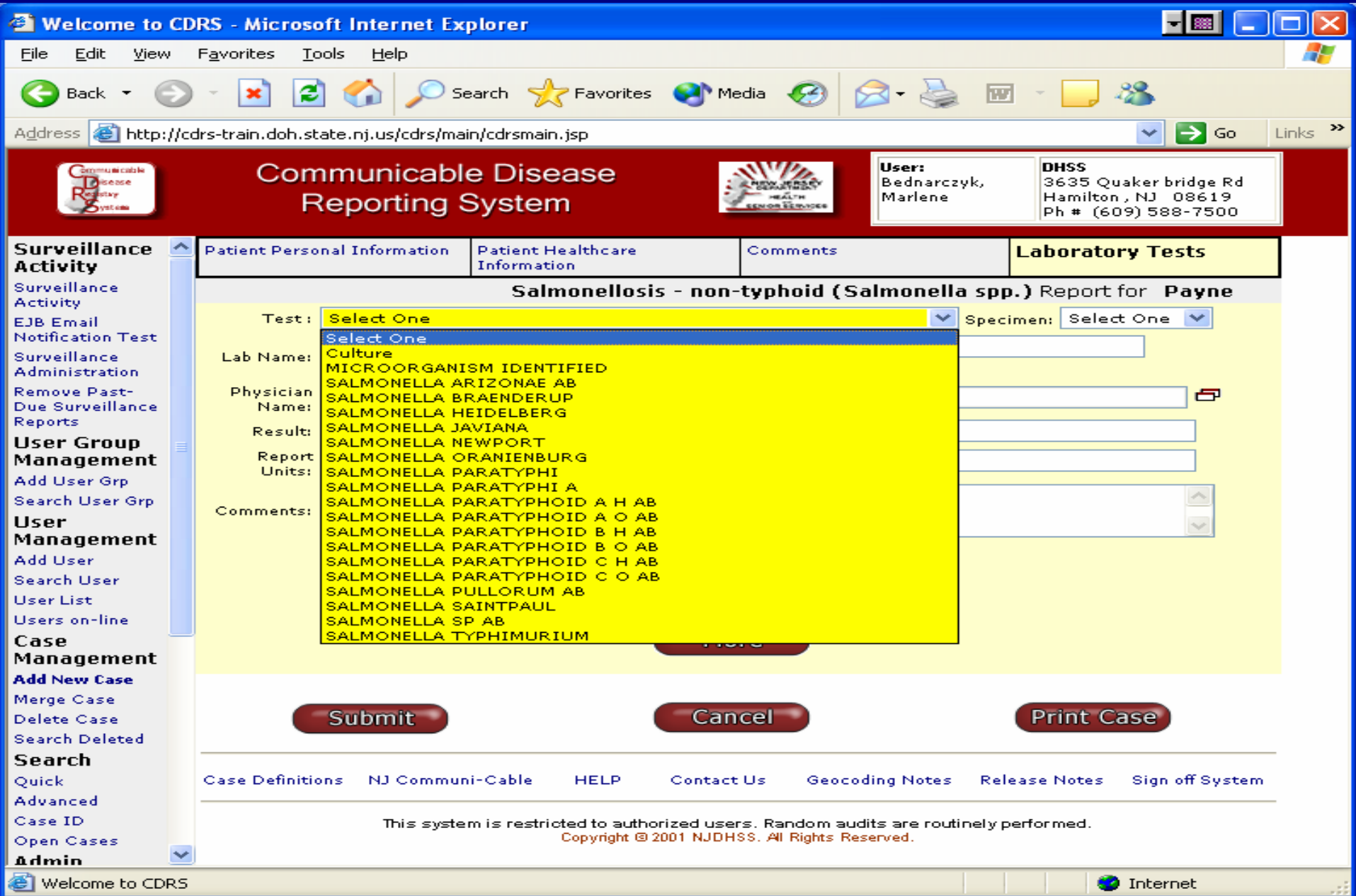
NOTE Isolates of *Salmonella* are to be submitted to the New Jersey Department of Health and Senior Services, Division of Public Health and Environmental Laboratories, P.O. Box 361, John Fitch Plaza, Trenton, NJ 08625-0361.

Done Internet

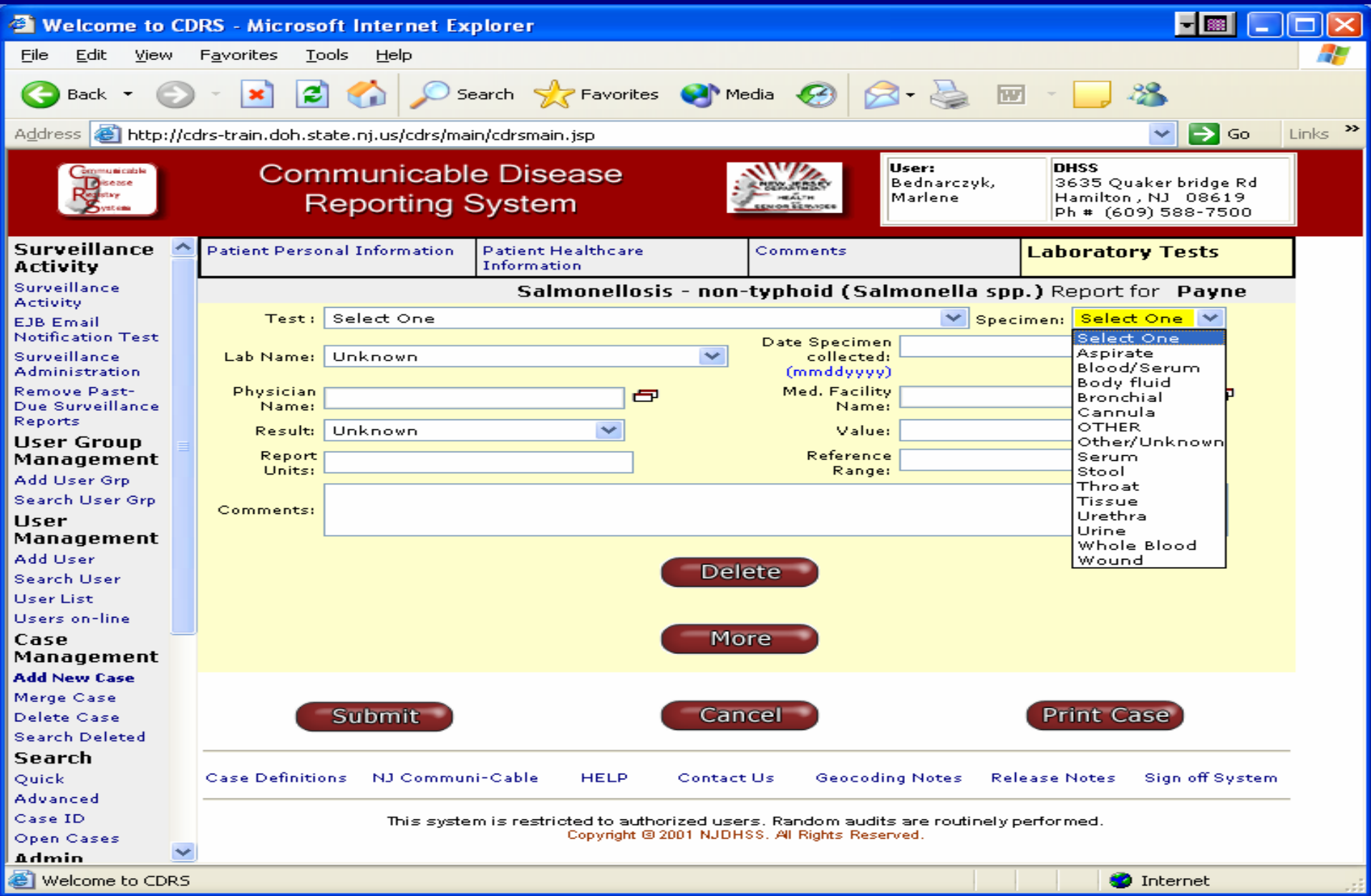
Laboratory Tests



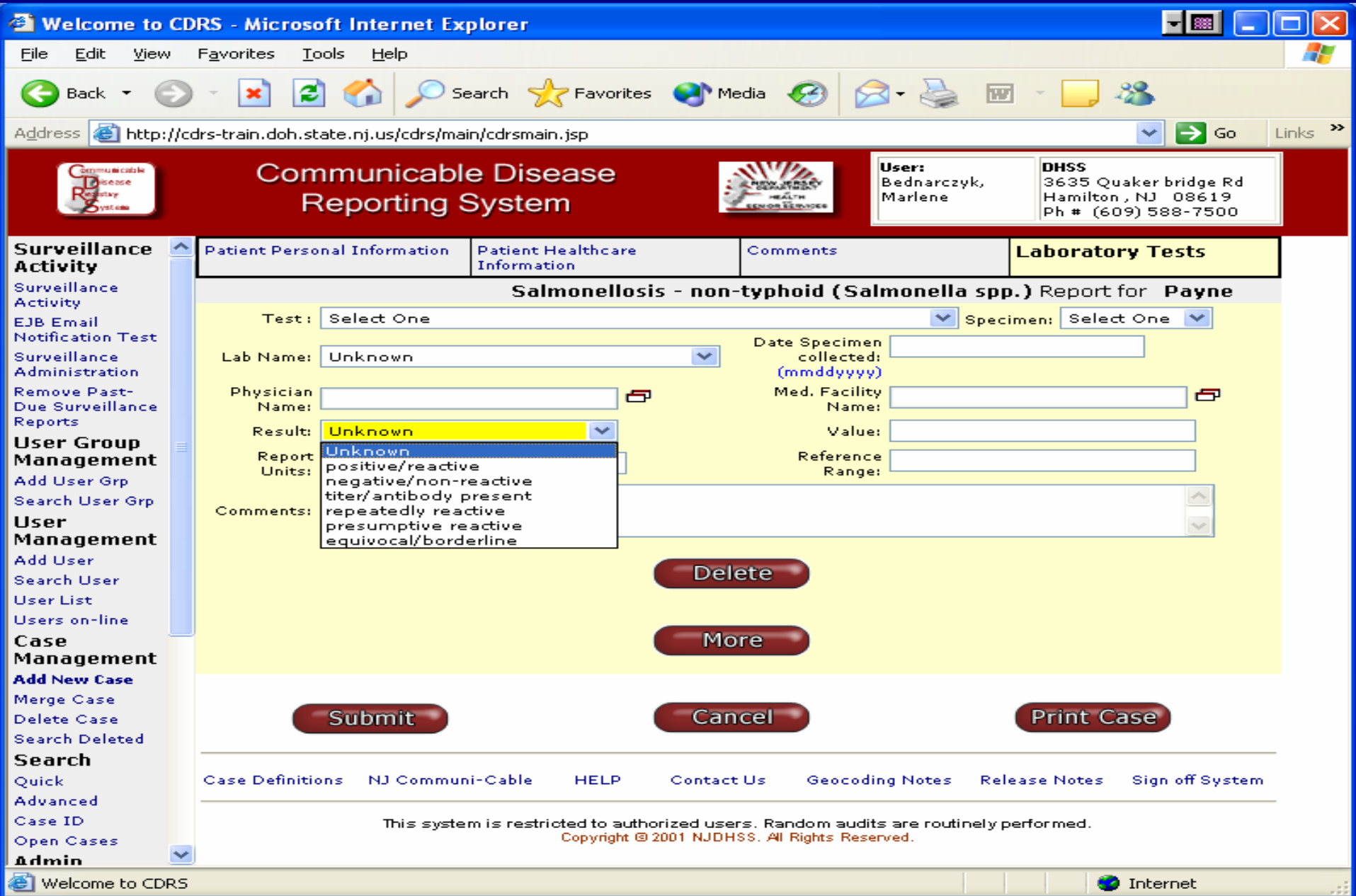
Lab Test Drop Down



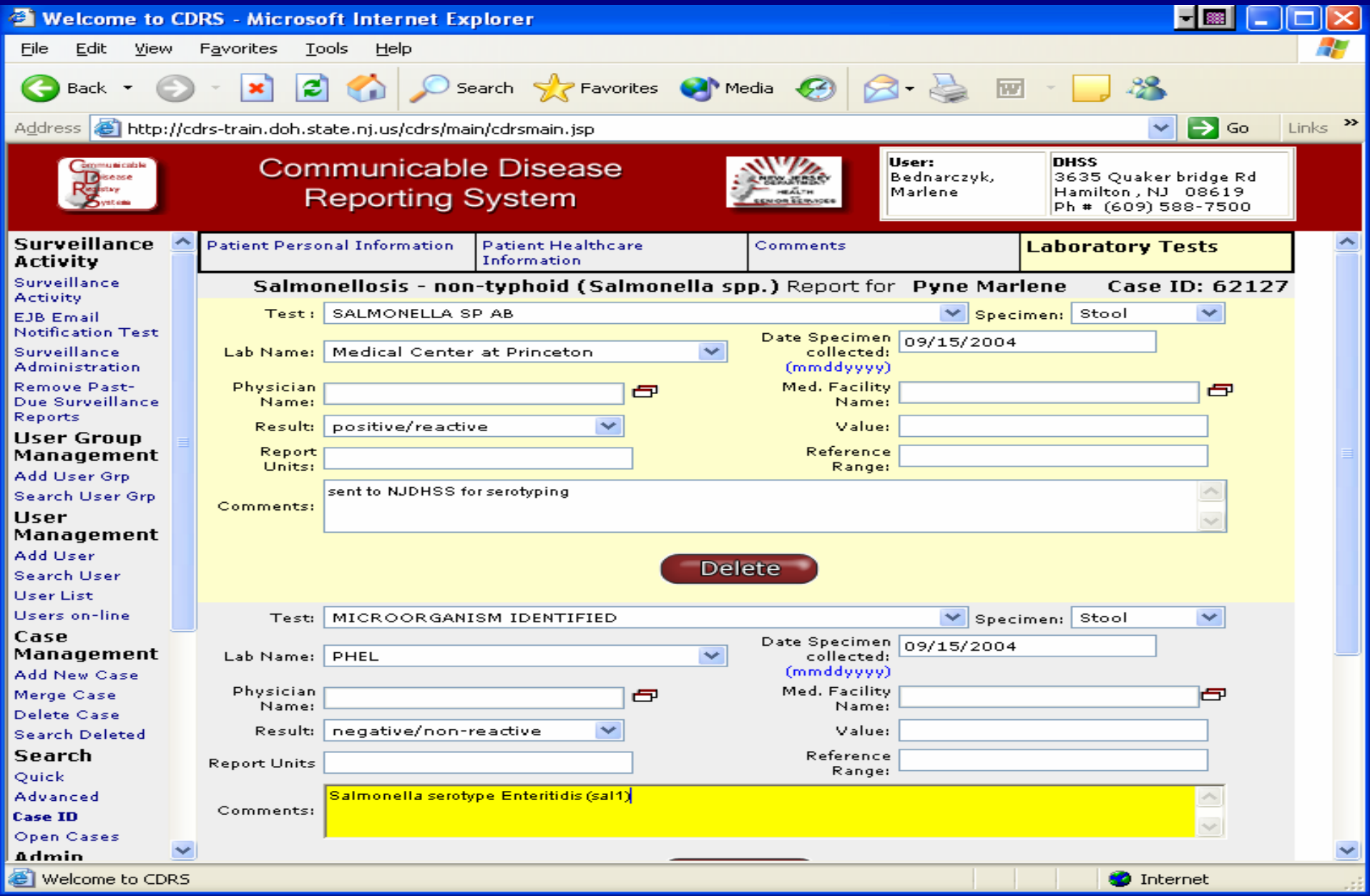
Specimen Drop Down



Results Drop Down



Serotype into Comments Section



Geocoding

Welcome to CDRS - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Search Favorites Media Address http://cdrs-train.doh.state.nj.us/cdrs/main/cdrsmain.jsp Go Links

Communicable Disease Reporting System

User: Jordan, Patricia

DHSS
3635 Quaker bridge Rd
Hamilton , NJ 08619
Ph # (609) 588-7500

Surveillance Activity
Surveillance Activity

User Group Management
Add User Grp
Search User Grp

User Management
Add User
Search User
User List
Users on-line

Case Management
Add New Case
Merge Case
Delete Case
Search Deleted

Search
Quick
Advanced
Case ID
Open Cases

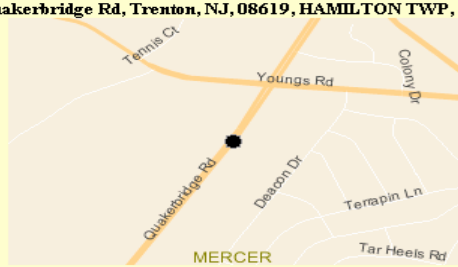
Reports
Standard reports
Admin reports
Surveillance reports

Resources
Update User Profile

Sign off System

A case with caseid 84267 has been successfully updated.

3635 Quakerbridge Rd, Trenton, NJ, 08619, HAMILTON TWP, MERCER



To return to your previous list, click here, or make a selection from the side menu.

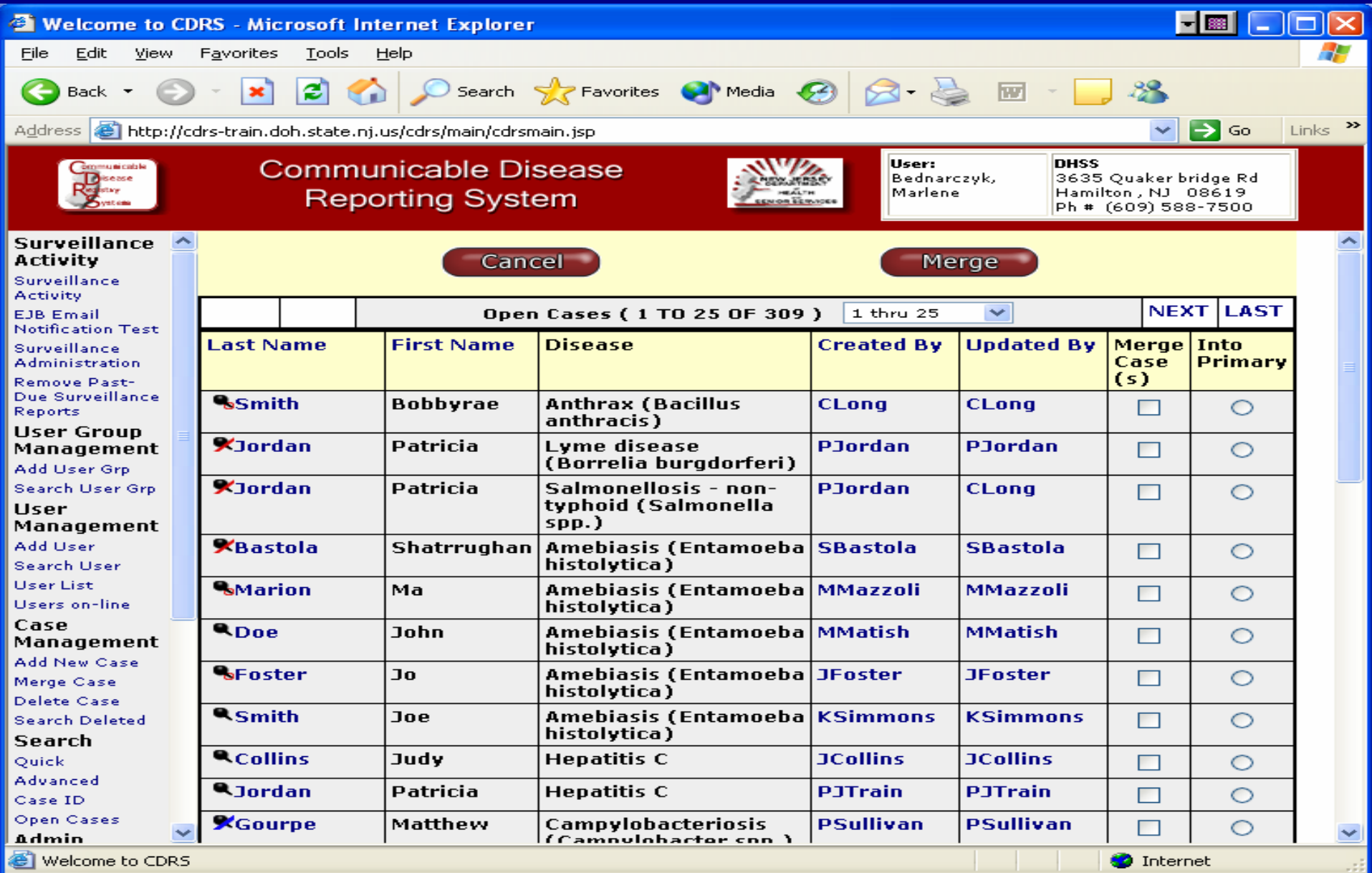
Case Definitions | NJ Communi-Cable | HELP | Contact Us | Geocoding Notes | Release Notes | Sign off System

This system is restricted to authorized users. Random audits are routinely performed.

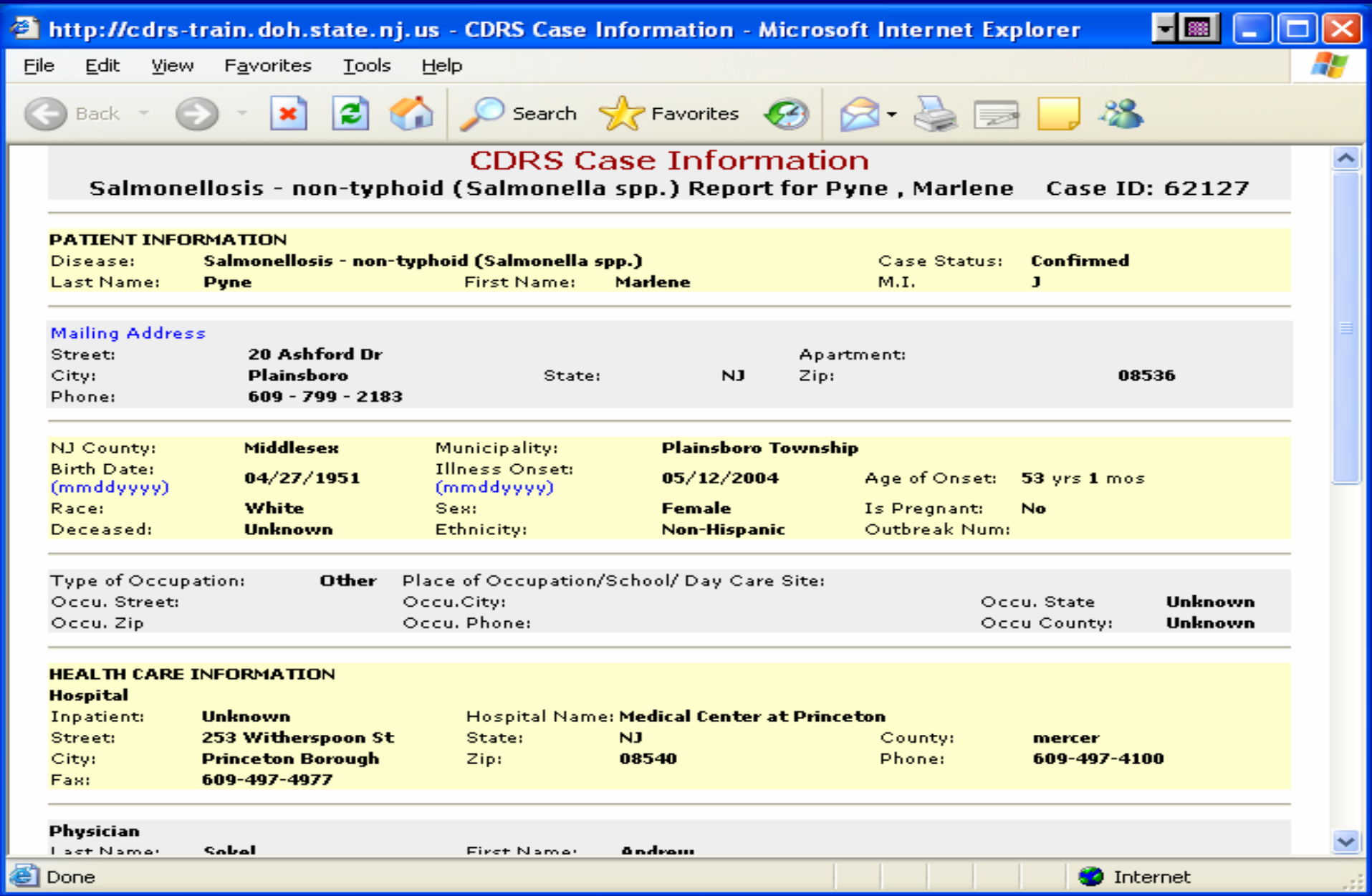
Welcome to CDRS | Internet

Start | Patricia A Jorda... | Welcome to C... | Microsoft Power... | 10:36 AM

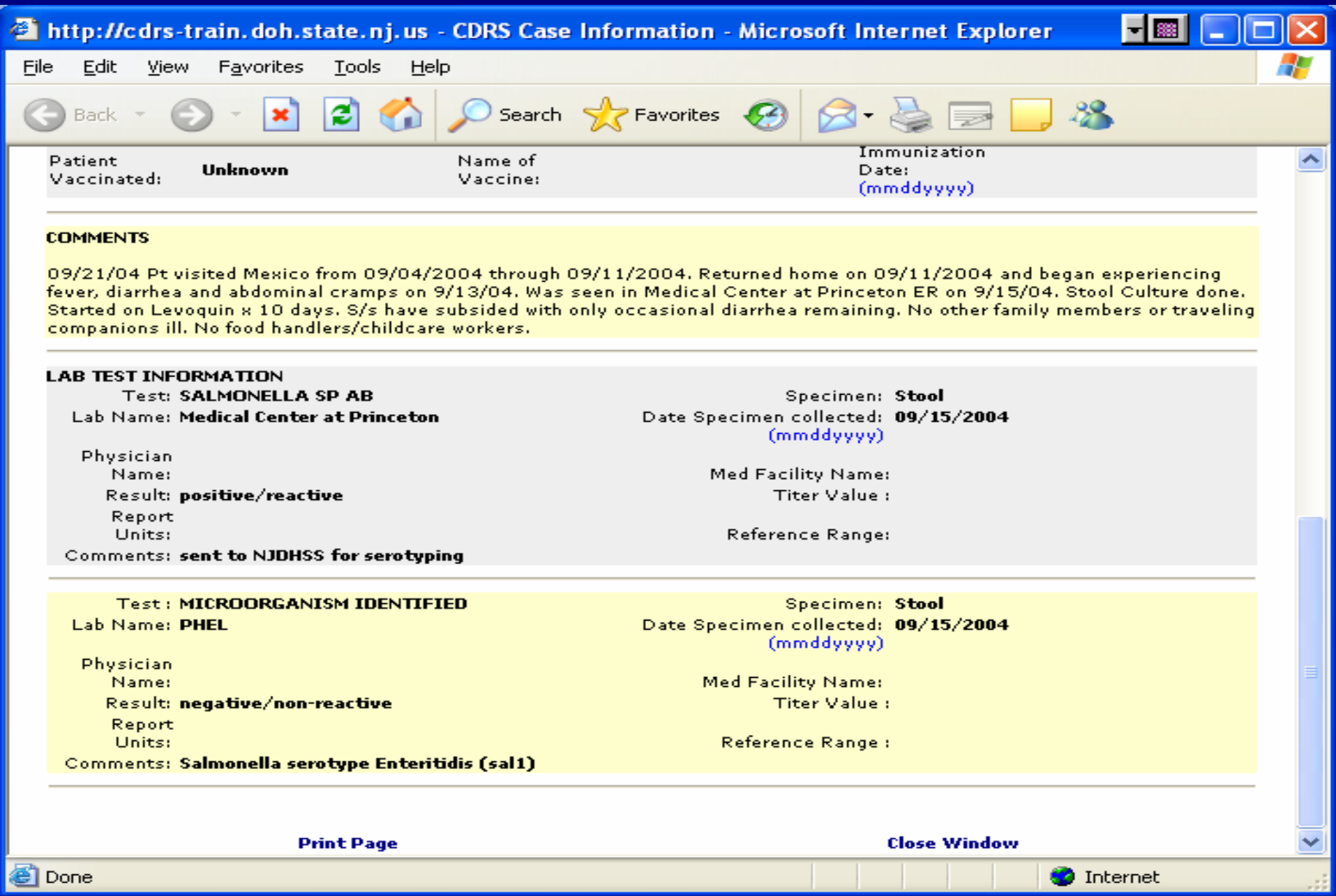
Geo-coding Icon Examples



Print Case – First Half

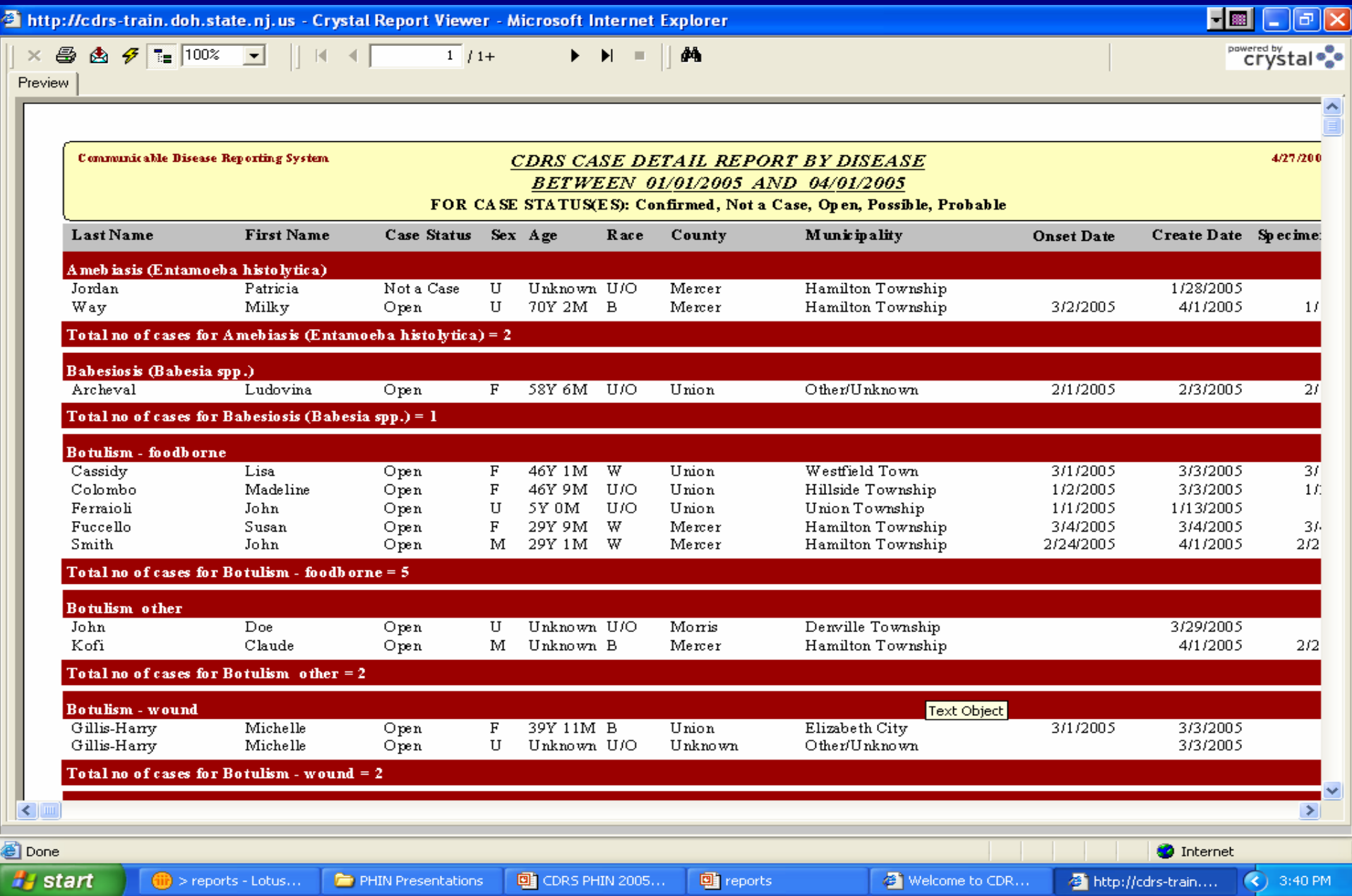


Print Case – Second Half



Examples of Reports Generated in the CDRS Training Site Containing Dummy Data

Case Detail by Disease



Last Name	First Name	Case Status	Sex	Age	Race	County	Municipality	Onset Date	Create Date	Specime
Amebiasis (Entamoeba histolytica)										
Jordan	Patricia	Not a Case	U	Unknown	U/O	Mercer	Hamilton Township		1/28/2005	
Way	Milky	Open	U	70Y 2M	B	Mercer	Hamilton Township	3/2/2005	4/1/2005	1/
Total no of cases for Amebiasis (Entamoeba histolytica) = 2										
Babesiosis (Babesia spp.)										
Archeval	Ludovina	Open	F	58Y 6M	U/O	Union	Other/Unknown	2/1/2005	2/3/2005	2/
Total no of cases for Babesiosis (Babesia spp.) = 1										
Botulism - foodborne										
Cassidy	Lisa	Open	F	46Y 1M	W	Union	Westfield Town	3/1/2005	3/3/2005	3/
Colombo	Madeline	Open	F	46Y 9M	U/O	Union	Hillside Township	1/2/2005	3/3/2005	1/
Ferraioli	John	Open	U	5Y 0M	U/O	Union	Union Township	1/1/2005	1/13/2005	
Fuccello	Susan	Open	F	29Y 9M	W	Mercer	Hamilton Township	3/4/2005	3/4/2005	3/
Smith	John	Open	M	29Y 1M	W	Mercer	Hamilton Township	2/24/2005	4/1/2005	2/2
Total no of cases for Botulism - foodborne = 5										
Botulism other										
John	Doe	Open	U	Unknown	U/O	Morris	Denville Township		3/29/2005	
Kofi	Claude	Open	M	Unknown	B	Mercer	Hamilton Township		4/1/2005	2/2
Total no of cases for Botulism other = 2										
Botulism - wound										
Gillis-Harry	Michelle	Open	F	39Y 11M	B	Union	Elizabeth City	3/1/2005	3/3/2005	
Gillis-Harry	Michelle	Open	U	Unknown	U/O	Unknown	Other/Unknown		3/3/2005	
Total no of cases for Botulism - wound = 2										

Graph of Disease Totals

Crystal Report Viewer - Microsoft Internet Explorer

92% 1 / 2 powered by crystal

Preview

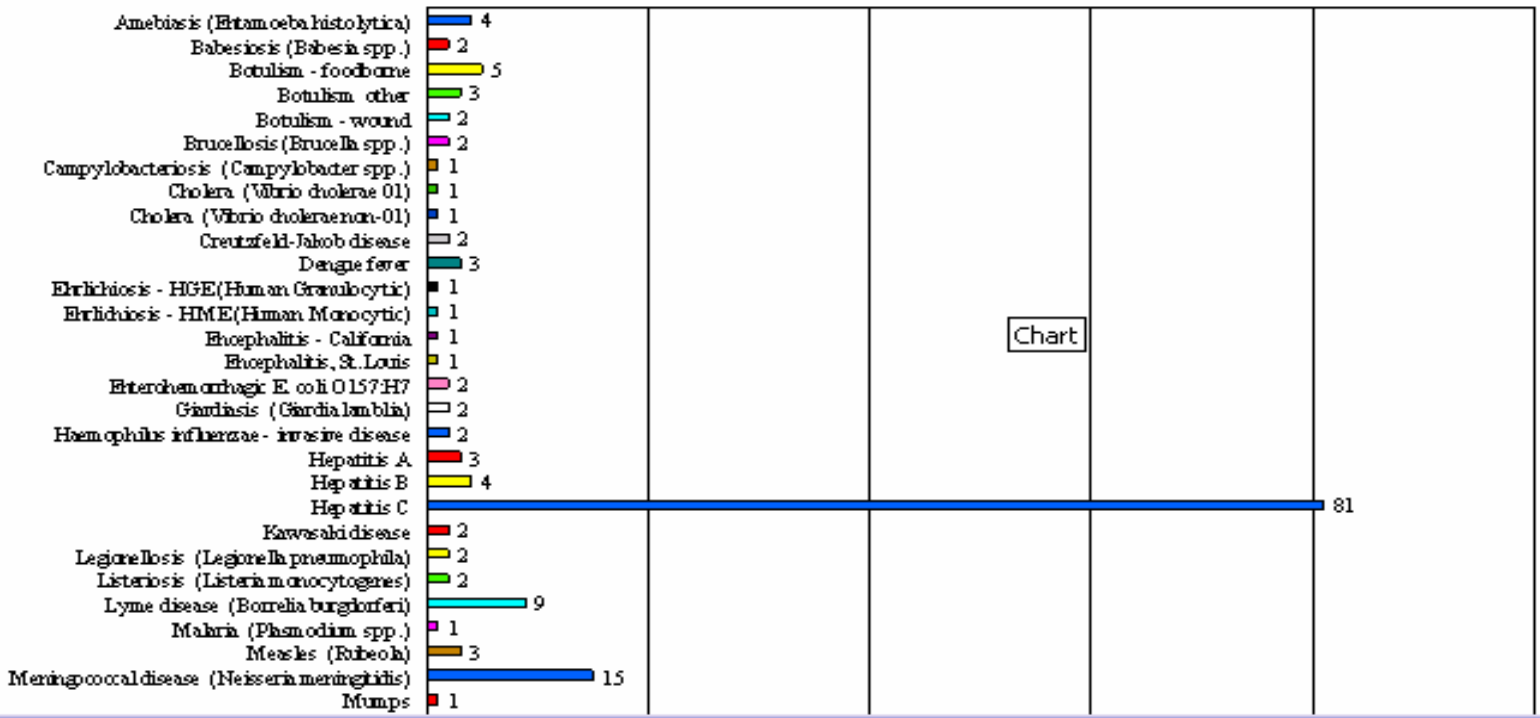
Communicable Disease Reporting System

INFECTIOUS & ZOONOTIC DISEASE PROGRAM

DISEASE TOTALS BETWEEN 01/01/2005 AND 04/27/2005

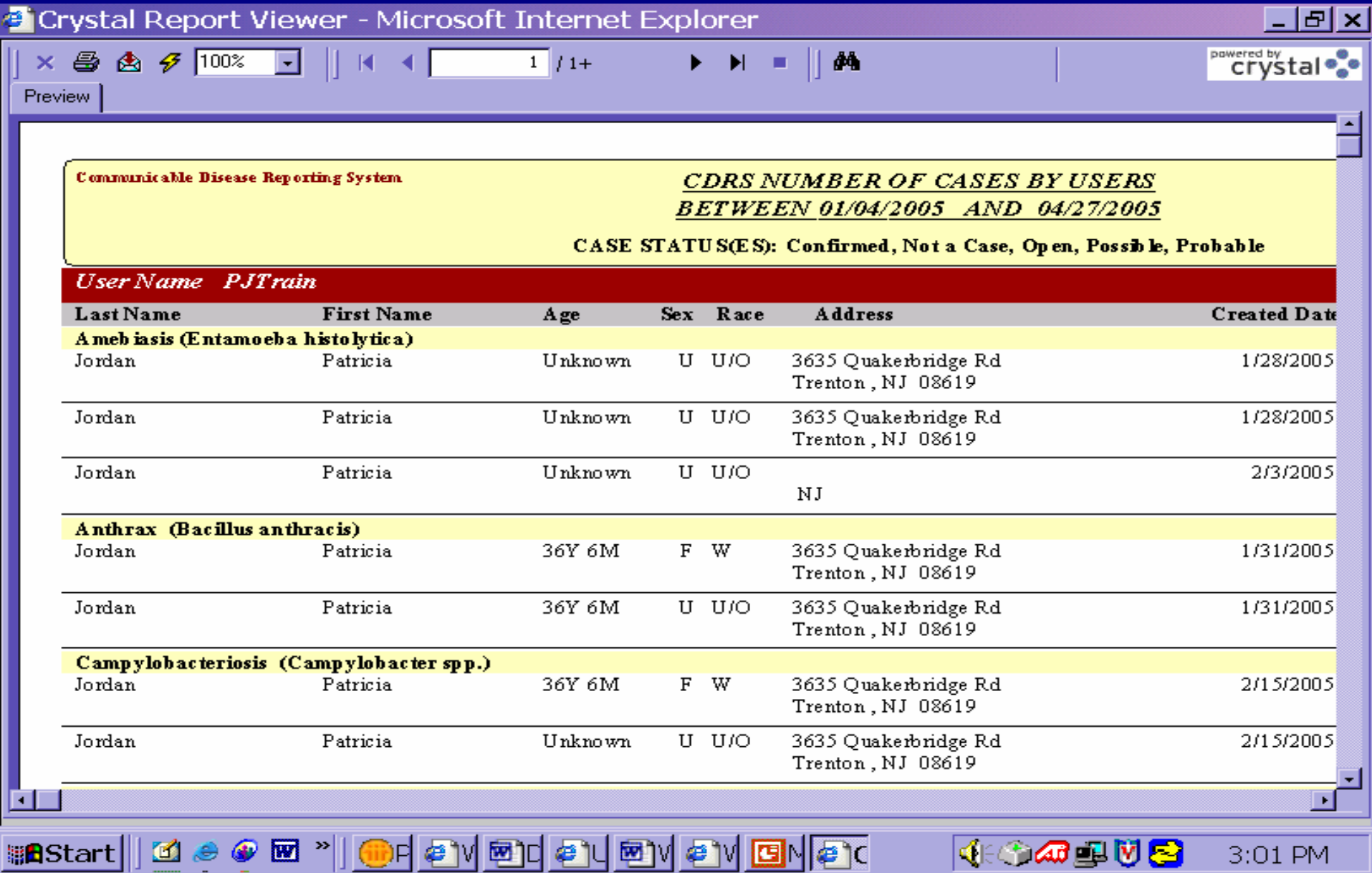
4/27/2005

CASE STATUS(ES): Confirmed, Not a Case, Open, Possible, Probable

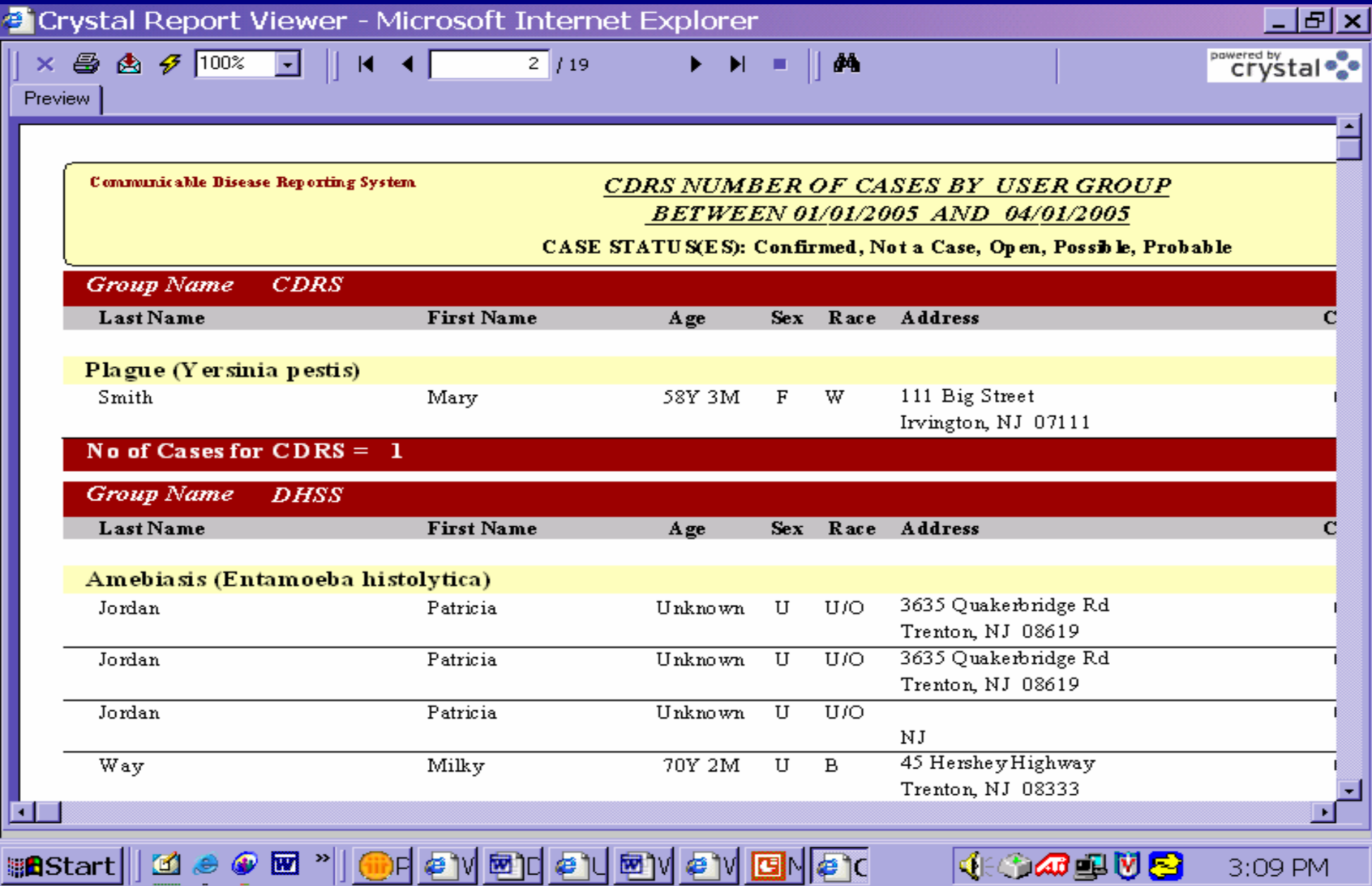


Start 2:59 PM

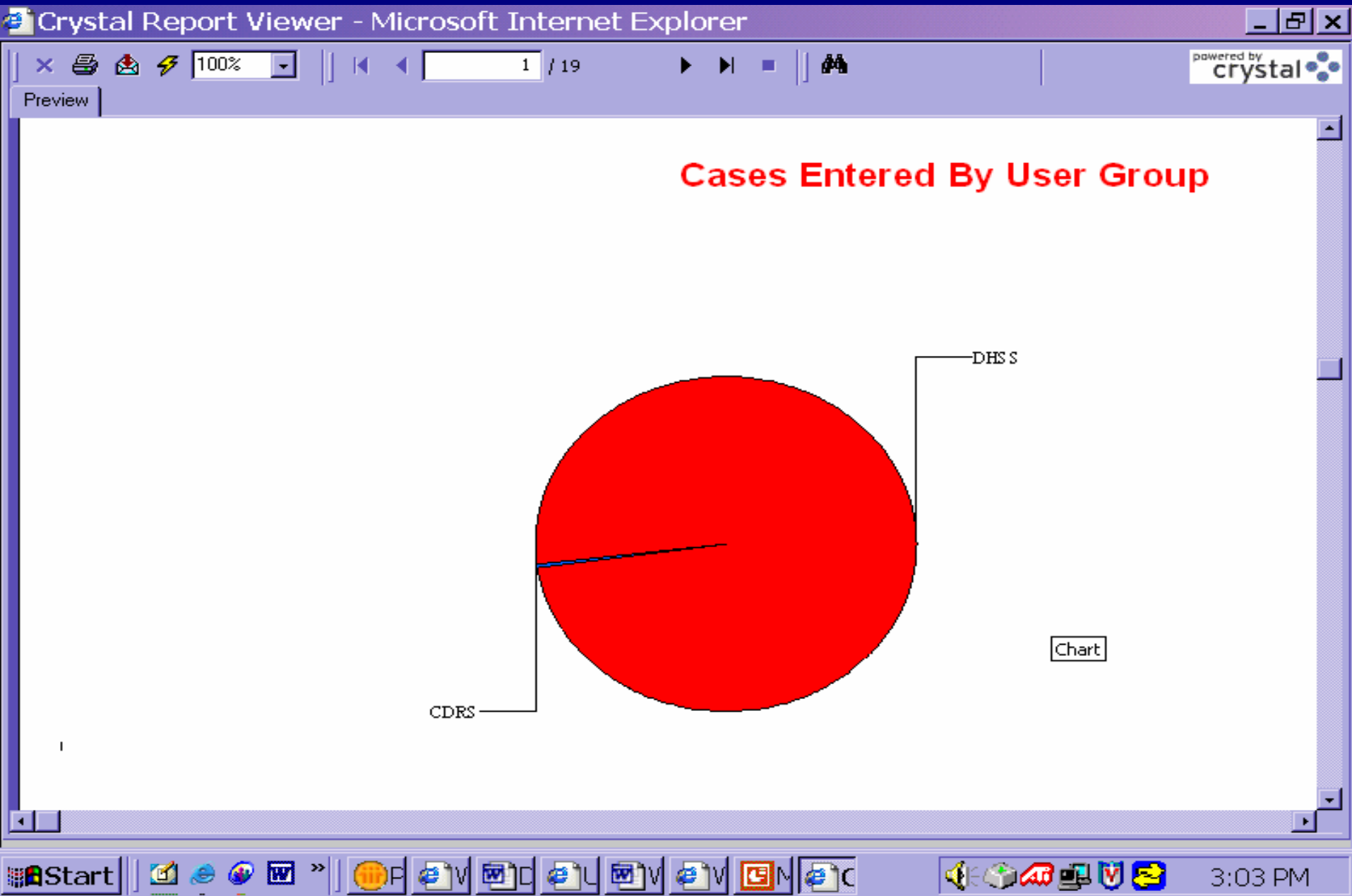
Number of Cases by Users



Cases by User Group



Pie Chart of Cases by User Group



Electronic Lab Reporting

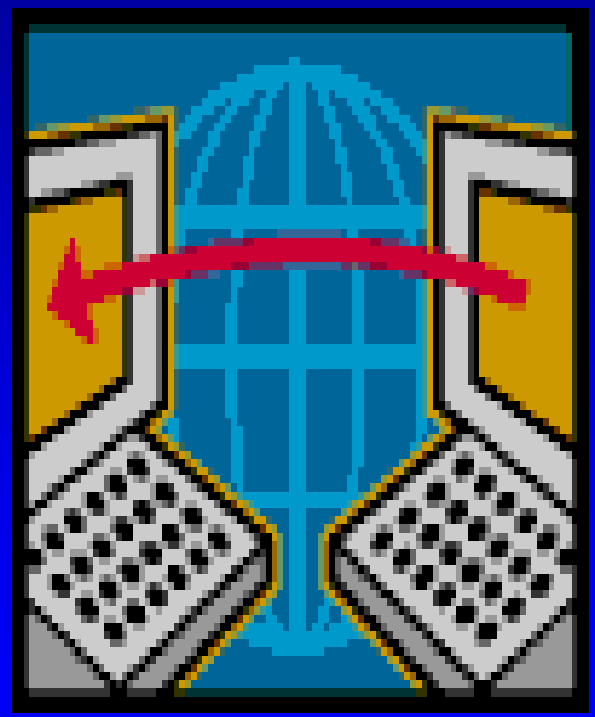
- HL-7
- LOINC/SNOMED coding
- Direct line feed from LabCorp
- Batched and submitted daily in HL7 format
- Parsed by OITS personnel and added to database daily for review and analysis by appropriate public health officers

CDRS LabCorp Transmission

- Errors are stored on error correction database for future analysis and rectification
- Administrative capabilities enable program personnel to address majority of errors without IT support
- LOINC SNOMED coding is also an administrative function, not an IT function

CDC Transmission Generated from CDRS

- Flat ASCII files generated from CDRS database weekly
- Combined with STD MIS and TB TIMS data and transmitted via NETSS to CDC for MMWR reports
- Data cleaning and final year end reconciliation for MMWR publication



What is Reported in CDRS

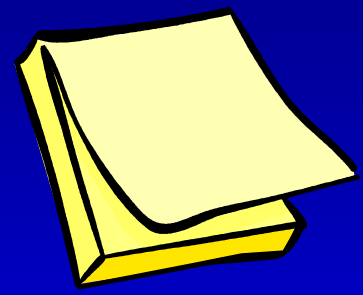
AMEBIASIS	EHRLICHIOSIS HME
ANTHRAX	ENCEPHALITIS – CALIFORNIA
BABESIOSIS	ENCEPHALITIS – EASTERN EQUINE
BOTULISM, FOODBORNE	ENCEPHALITIS – WESTERN EQUINE
BOTULISM, INFANT	ENCEPHALITIS – ST. LOUIS
BOTULISM, OTHER	ENCEPHALITIS – WEST NILE
BOTULISM, WOUND	E-COLI – NOT SEROGROUPED
BRUCELLOSIS	E-COLI – 0157:H7
CAMPYLOBACTER	E-COLI – NON 0157:H7
CHOLERA, VIBRIO CHOLERAE 01	GIARDIASIS
CHOLERA, VIBRIO CHOLERAE NON-01	GUILLAIN-BARRE SYNDROME
CRUETZFELD-JAKOB DISEASE	HAEMOPHILUS INFLUENZAE
CRYPTOSPORIDIOSIS	HANSEN DISEASE
CYCLOSPORIASIS	HANTAVIRUS PULMONARY SYNDROME
DENGUE FEVER	HEMOLYTIC UREMIC SYNDROME
DIPTHERIA	HEMORRHAGIC COLITIS
EHRLICHIOSIS HGE	HEPATITIS A

What is Reported in CDRS Cont'd

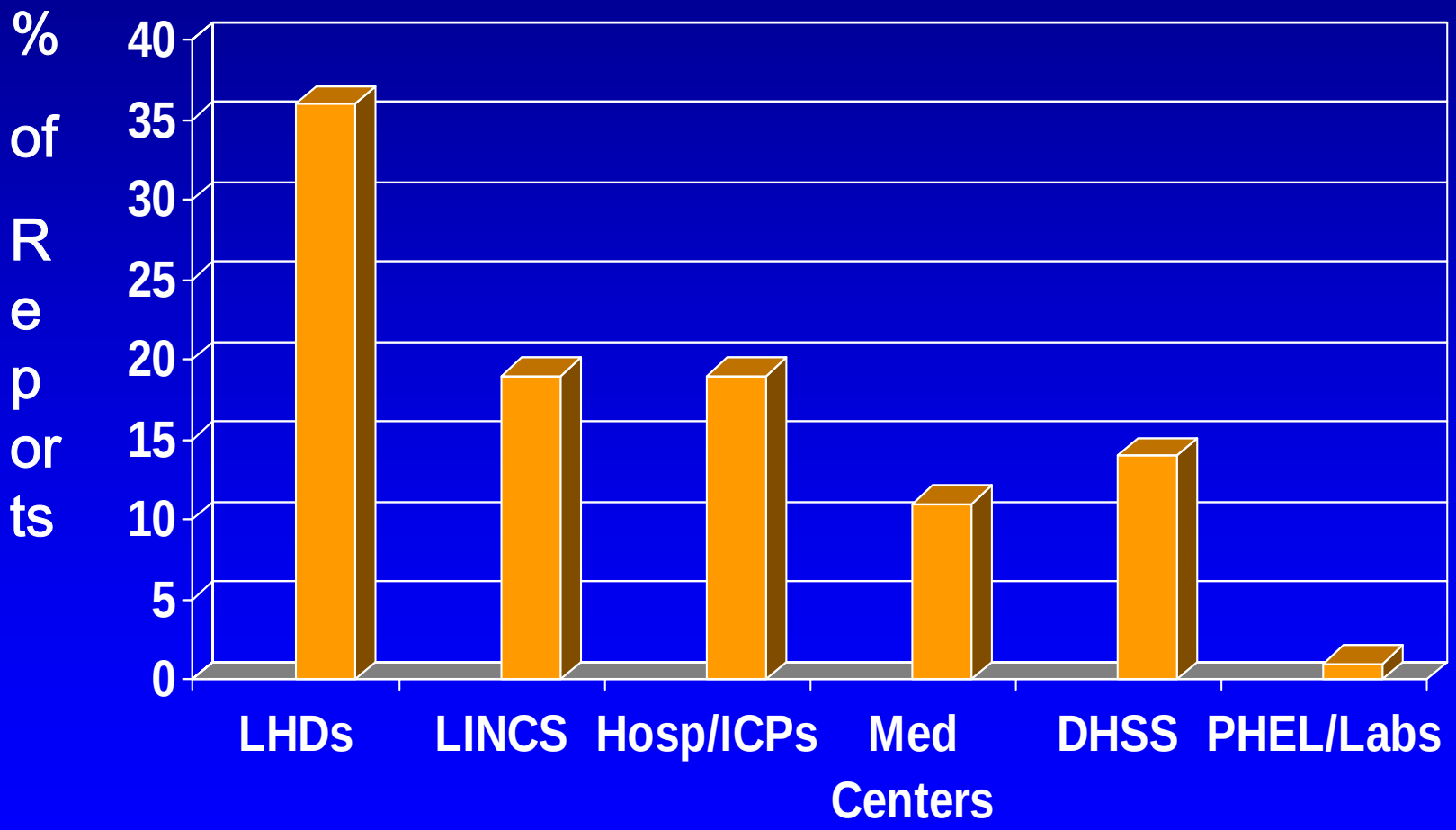
HEPATITIS B	RUBELLA
HEPATITIS B – PERINATAL	RUBELLA, CONGENITAL SYNDROME
HEPATITIS C	SALMONELLOSIS
KAWASAKI DISEASE	SHIGELLOSIS
LEGIONELLOSIS	SMALLPOX
LISTERIOSIS	STREPTOCOCCUS PYOGENES
LYME DISEASE	STREPTOCOCCUS AGALACTIAE
MALARIA	STREPTOCOCCUS PNEUMONIAE
MEASLES	TETANUS
MENINGOCOCCAL DISEASE	TOXIC SHOCK SYNDROME – STAPH
MUMPS	TOXIC SHOCK SYNDROME – STREP
MYCOBACTERIUM, NON-TB	TRICHINOSIS
PERTUSSIS	TULAREMIA
POLIOMYELITIS	TYPHOID FEVER
Q FEVER	VIBRIO SPP OTHER THAN CHOLERAE
RABIES	YELLOW FEVER
ROCKY MOUNTAIN SPOTTED FEVER	YERSINIOSIS

How the Reporting Gets Done

- Immediately reportable by telephone
- Paper reporting by mail, fax
- Report electronically



Current User Base
Types of Entities Reporting in 2004



Who is using the CDRS?

- LHDs
- ICPs
- LINCS Epis
- PHRN
- Lab
- Micro
- PHEL
- HOs

- Epis
- PHE
- Clerical staff
- Managers
- Planners
- Directors
- RNs
- Physicians

Want to See More?
Visit the CDRS Training Site

CDRS training site

http://cdrs-train.doh.state.nj.us

User ID: PHINuser

Password: PHINuser

(Case sensitive, all one word, no spaces)

But how did we get here?

Pre CDRS

- NJDHSS recorded reportables from CDC 1 forms into IZDP database in Epi Info 6
- All reports received by phone, fax, mail
- Reports took days, weeks and months to process
- Under-reporting prevalent

2001 – CDRS Begins

- October 2001
- First users were NJDHSS staff
- NJDHSS staff entered 3660 cases in CDRS in last quarter of year (100% of cases entered)
  - Balance of cases had already been entered in IZDP database during first three quarters of year
- Reports received by phone, fax, mail
- DHSS did all data entry in CDRS

Initial Roll Out of CDRS in 2002

- Rolled out to 5 county health offices
- Local health departments began to do some data entry (LHDs)
- Implemented LabCorp direct line feed via HL7 on November 4, 2002
- DHSS still did majority of data entry

Continued Roll Out in 2003

- Completed roll out to rest of 21 counties
- Began to include hospitals and labs
- Established forum for user feedback
- Hospitals and labs expressed interest in reporting
- Direct line feed provided majority of reporting
- DHSS still major reporter

Final Roll Out for CDRS in 2004

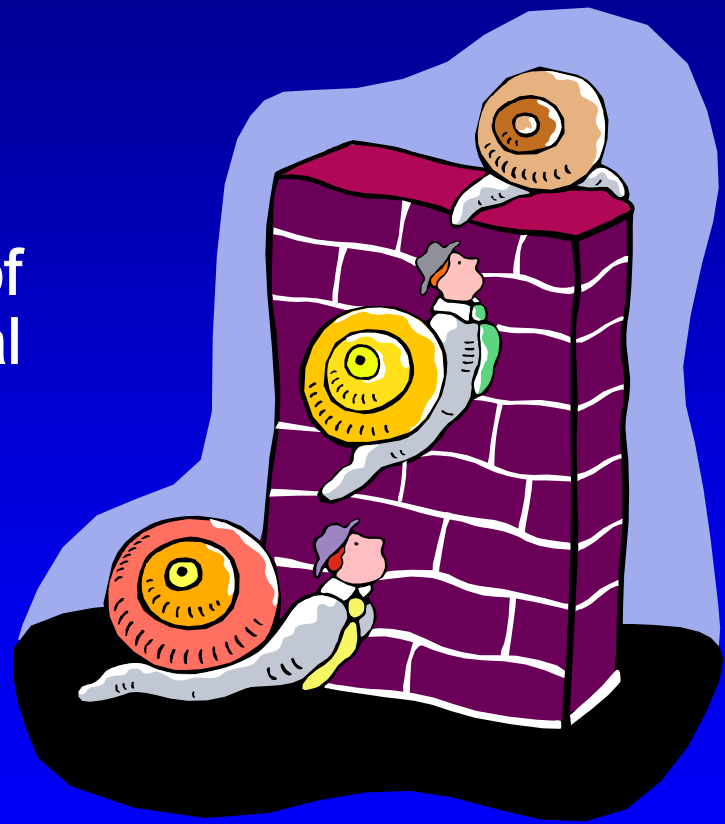
- Rolled out to rest of acute care hospitals and labs
- 80 of 81 hospitals on board
- Physicians expressed interest in reporting
  - A few physicians joined in
- Majority of reporting shifted to local level

And Today in CDRS

- Ongoing new user training as needed
  - New users coming forward and establishing reporting partnerships
  - Further roll-out to physicians delayed due to development of new comprehensive system
- 955 users in 257 user groups
- TOPOFF3 in training site
    - Over 16,000 cases in one week
    - 143 users doing data entry
    - 385 users actively in system out of 1047 registered users in training site

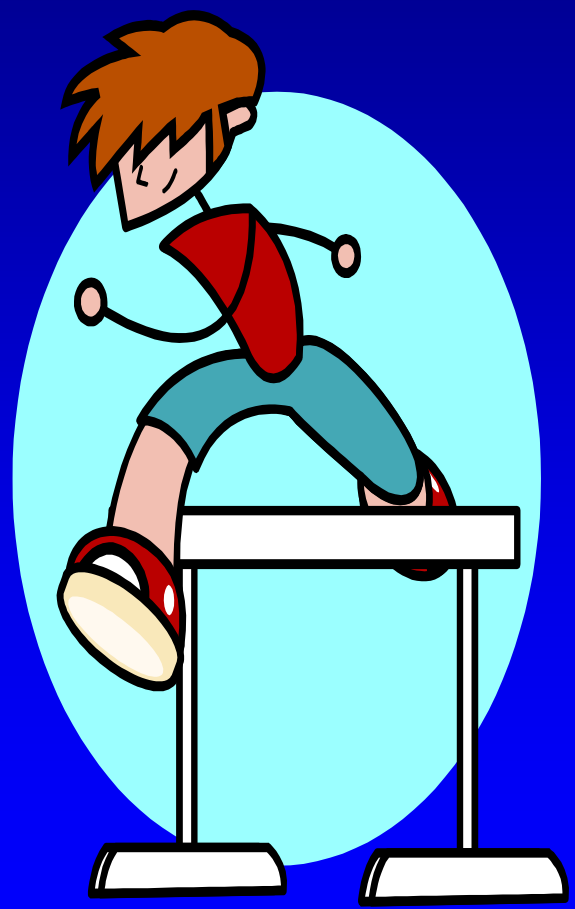
Obstacles to Progress

- Resistance
  - to change
  - to technology
  - to a new reporting method
- Lack of credibility of universality of system due to long developmental history
- Multiple levels of technical expertise
- Multiple levels of technology available to end users – local limitations
- Maintenance of double records



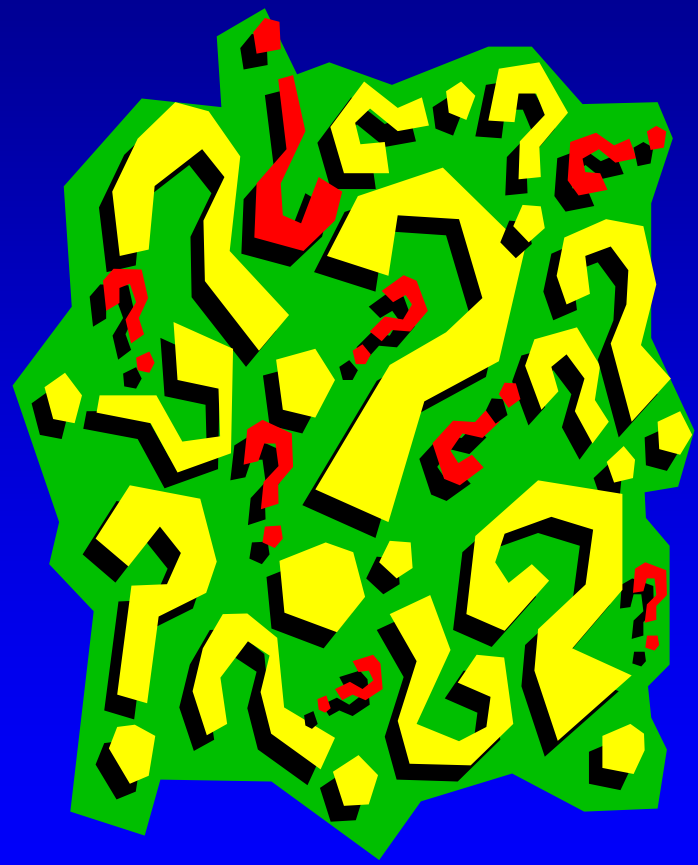
Hurdles to Overcome

- Lack of
  - response to user concerns
  - actual teaching
  - support personnel for users
- Need for help desk function
- Limitations of
  - technical support on-site for users
  - user hardware and connectivity
  - functionality of state system



Problems Incurred

- Changing staff at DHSS
- Absence of
  - personnel assigned to roll-out
  - methodology for roll-out
  - methodology for training
- Need to address various learning styles – auditory, visual, kinetic
- Unsupported shift from reporting to investigating
- Speed and volume of direct line reporting burdensome to locals



Teaching Format Changes Over Time

2001

- One data entry person
- Trained by IT program manager
- 31 users in system
  - –DHSS and OITS staff

Teaching Format Changes Over Time

2002

- “Selling” to health officers (HOs)
- Half hour demonstration
- Training was in passive, lecture format
- End user/data entry people didn’t attend
- Only second hand info from HOs
- Very little help desk support
- 131 users in system

Teaching Format Changes Over Time

2003

- Initially lecture “Selling” format
- Hour and a half demo
- Active, hands-on training began mid-year with users at individual terminals in classroom setting
- Data entry people invited to attend
- Increased help desk support
- Increased training
- 500 users in 213 user groups

Teaching Format Changes Over Time

2004

- Active, hands on entry of dummy data in system by users in training site on individual terminals
- Two hour plus sessions
- User manual was originally very technical, changed to user friendly format
- 892 users in 250 user groups

Reporting in CDRS in 2002

- NJDHSS staff entered 9,773 cases (66%)
  - LHDs and LINCS agencies entered 1,550 cases (11%)
- LabCorp direct line feed established in November
  - 3,285 cases entered directly by LabCorp (22%) [273/month]
  - New cases displayed on open cases screen with name, address and lab results info already entered in case
  - Hard copy of LabCorp tests sent to appropriate LHD

Reporting in CDRS in 2002 Cont'd

- Reports received by phone, fax, mail and direct line feed
- Total cases in CDRS in 2002 = 14,608
- 1217 cases /month

Reporting in CDRS in 2003

- NJDHSS staff entered 5,748 cases (25%)
- LHDs, hospitals (ICPs and lab techs) and LINCS agencies entered 6,397 cases (29%)
  - Nurses, ICPs and labs asked permission to report electronically
  - Slowly increased local data entry

Reporting in CDRS in 2003 Cont'd

- LabCorp entered 10,464 cases directly (46%) [872/month]
- Increased level of direct line feed reporting = full year's worth
- Reduced amount of reports by mail, phone, fax
- Total cases in CDRS in 2003 = 22,609
- 1884 cases per month

Reporting in CDRS in 2004

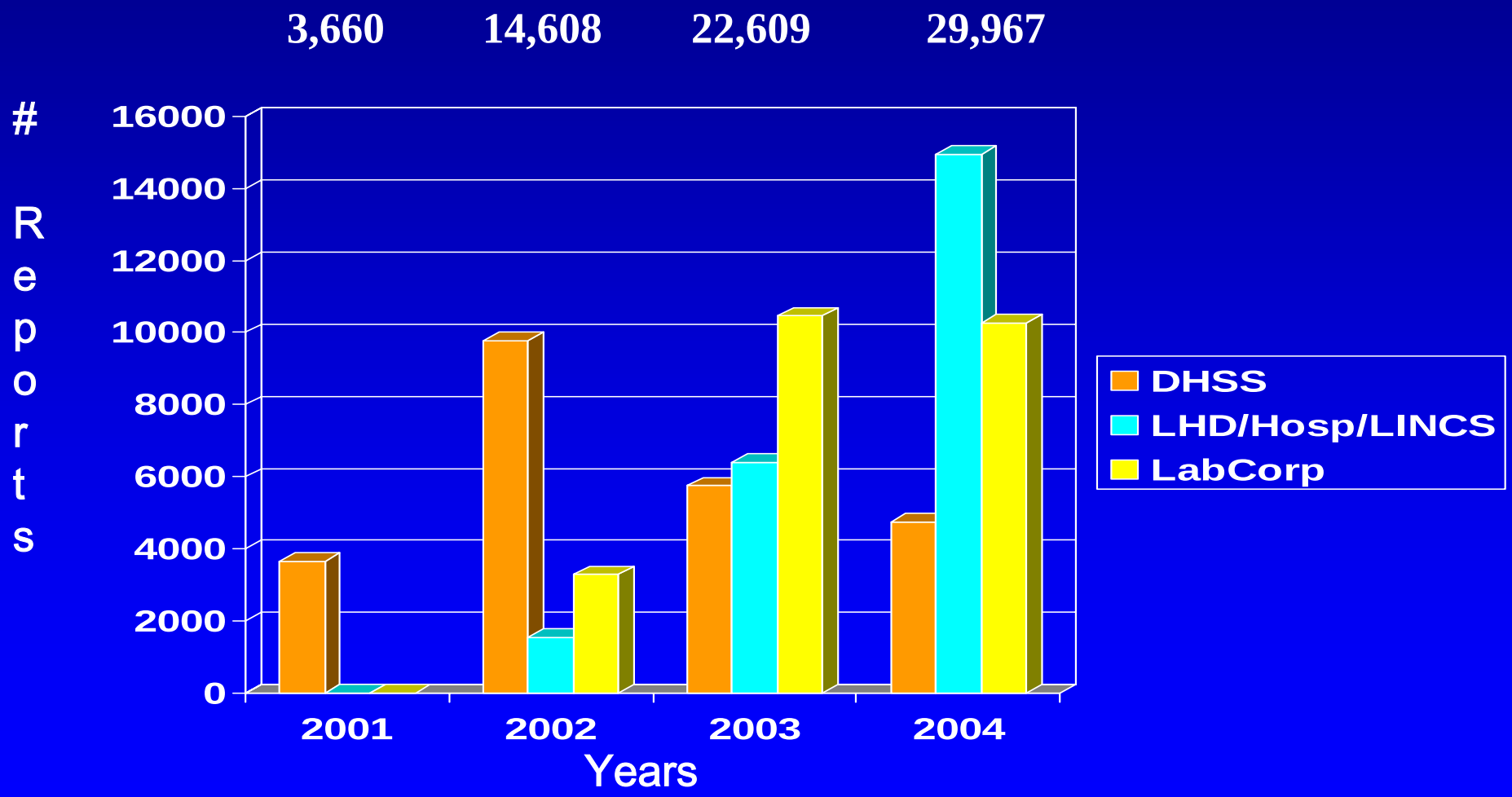
- NJDHSS staff entered 4,754 cases (16%)
  - Greatly reduced phone, fax and mail received
  - Greatly decreased data entry at State
- LHDs, hospitals (ICPs and lab techs) and LINCS agencies entered 14,940 cases (50%)
  - Greatly increased local data entry

Reporting in CDRS in 2004 Cont'd

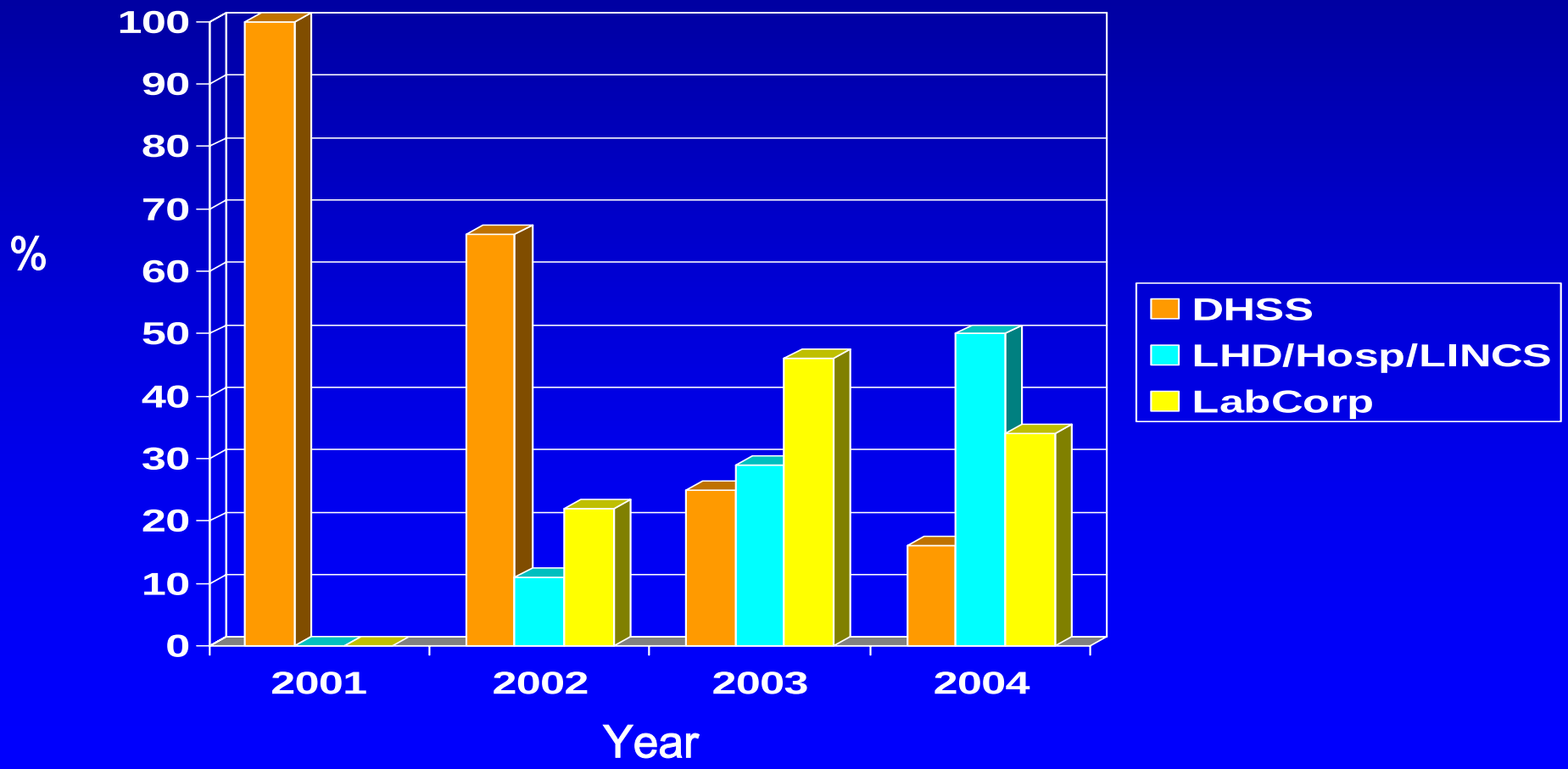
- LabCorp entered 10,273 cases directly (34%) [856/month]
  - Same level of reporting as 2003 but lower %
- PHEL developing direct line feed and doing manual data entry in interim
- Total cases in CDRS in 2004 = 29,967
- 2497 cases per month

Huge Shift in Data Entry Activity

Total # of cases electronically reported per year



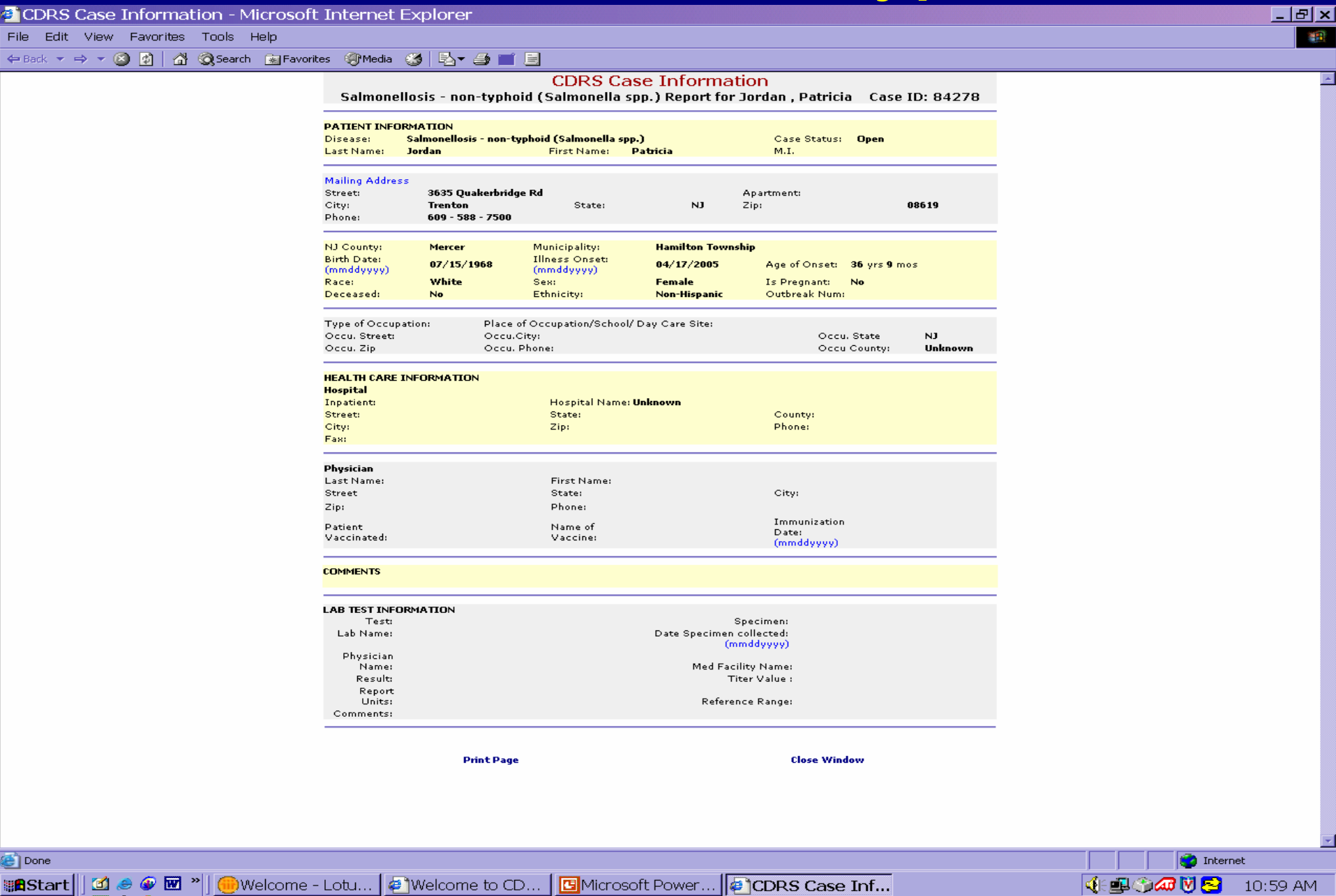
Shift in Data Entry by Percent



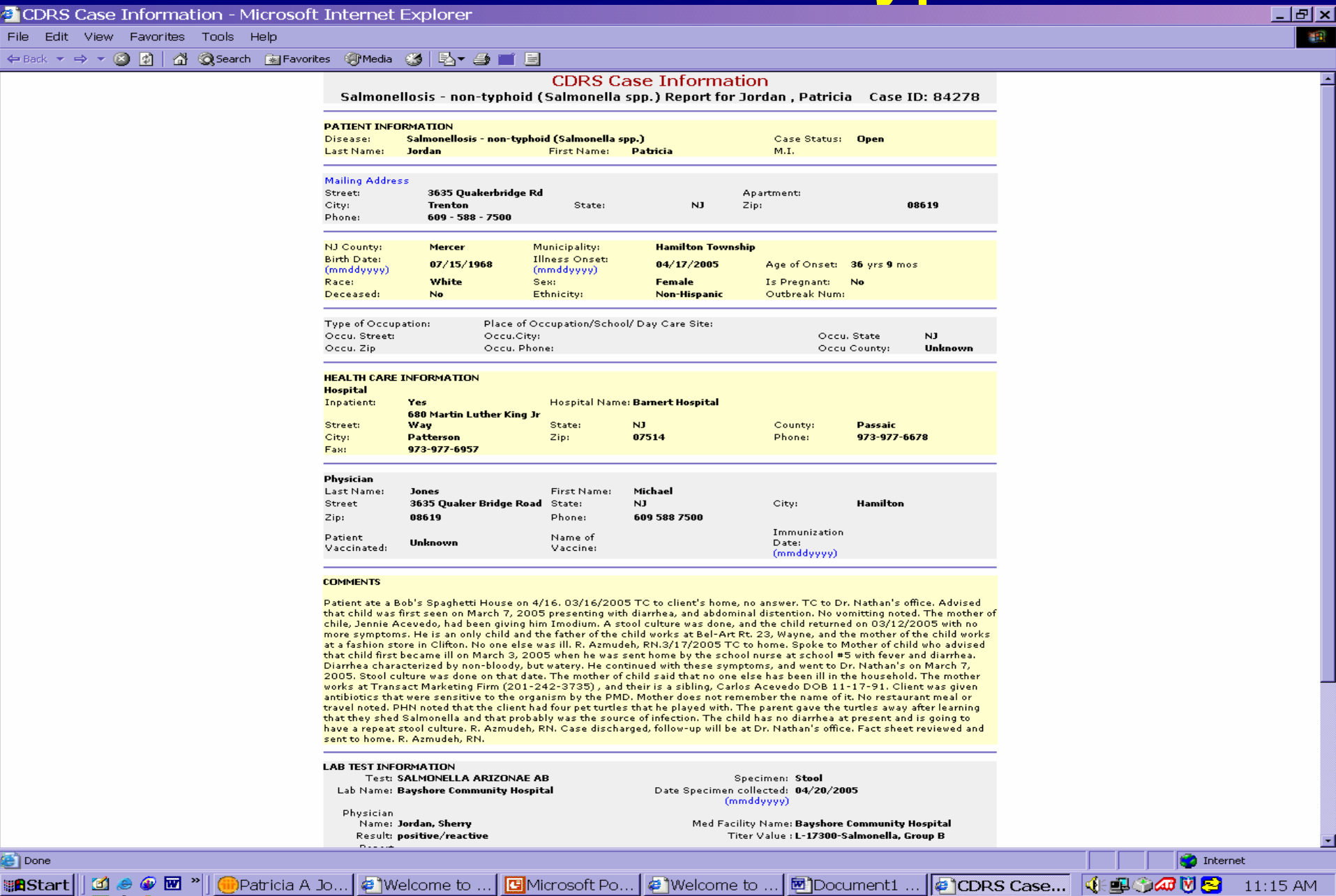
Changing Type of Info Entered

- Not only user base and quantity changing
- Type of information changing
- More detailed, investigative rather than just data entry
- Greater volume of data – CDRS becomes central clearing house for information

Print Case with 2001 Type of Data



Print Case with 2004 Type of Data



CDRS Progress

- Summer of 2003 = 28 days to report cases
- Summer of 2004 = 3 to 4 days to report cases

- April, 2003 – 240 users in 67 user groups
- December, 2003 – 500 users in 213 user groups
- December, 2004 – 892 users in 250 user groups
- 2005 to date – 955 users in 257 user groups

- Presently used in 21 counties, 114 LHDs, 80 acute care hospitals and one commercial lab
  (via direct line feed)

CDRS Progress Cont'd

- Pilot to bring PHEL onto direct line feed in process – meanwhile manually entering data in CDRS
- Piloting a project with Misys and Meridian Health Systems for direct line feed to CDRS like LabCorp
- Eventually all acute care hospitals will have direct line feeds

CDRS Improvements

- Transition from paper to electronic case reporting
- Increased capacity to log case information in one central place (50 pages worth)
- Geo-coding capabilities
- E-mail capabilities
- New reports and updates based on user feedback

CDRS Bonuses

- Electronic versus manual reporting more timely
- Entered by locals on-site rather than centrally by the State
- Increased reporting level
- One stop reporting
- Available 24/7
- Faster disease incidence follow-up
- Data entered is available statewide as soon as submitted on website - updates and error corrections too
- Takes seconds electronically versus minutes/hours by fax versus days by mail

Evolution of CDRS Training Format

1. Initially "selling" electronic reporting
   - half hour overview of system and screens to management
2. Selling/pseudo teaching
   - one hour and a half demonstration
   - still only to management
3. Teaching
   - two hours session
   - actual data entry people begin to attend

Evolution of CDRS Training Format

4. Hands on teaching
   - two hours plus
   - data entry people actually use training site during training at individual terminals in educational setting

5. Hands on teaching with user feedback
   - two hours
   - user experiences and problems incorporated into training sessions
   - training manual developed and provided as resource - small regular training sessions plus large, on-site training as needed

Learnings

- Must be customer/end-user focused and responsive to them
- The outside or local experience is often very different from that of in-house users
- It has to be safe to make a mistake
- Experience is the greatest teacher and sharing experiences shares knowledge
- It is a continuous improvement process

Learnings

- Need protocols for clear guidance about reporting diseases
- Never assume knowledge, technical or otherwise
- There is a huge gap between the theoretical and the practical
- Need clear requirements before you can demand compliance
- Need to understand how your users use the system to do their work

Learnings

- Do not design or develop materials or modules without end-user input
- Test and run a pilot of everything you do
- Know how the system works – the algorithms behind the scenes for troubleshooting
- Need a comprehensive working knowledge of the system to be able to teach it

Benefits of Changes in Training

- Hands-on learning more effective
- Rapport built between trainer and users – good for follow-up questions
- Actual data entry people trained
- Reporting quality increases
- Trained by knowledgeable “been there” user

Side Benefit of New Training

- Partnerships developing between users themselves and between users and DHSS
  - Troubleshooting problems/issues together
  - Forwarding cases outside of jurisdiction to appropriate health departments
  - Scheduling joint training sessions to share resources and State trainer
  - Cross functional training by local staff – LINCS Epis and hospitals, labs, data entry clerks

The Future:
A Major Shift to a New System

CDRS

- Communicable disease reporting system
- Case centric
- Reporting system

CDRSS

- Communicable disease reporting and surveillance system
- Patient centric
- Reporting and surveillance system

And New Training Materials

- Training software loaded on website and available to all users
  - Task specific tutorials
  - Simulations
  - Training manuals
    - User
    - Help desk
  - Disease specific protocols as available

Special Support Materials

- Quick Reference guide
- FAQs
- New user guide
- Help desk guide
- Disease specific tutorials
- Administration report guide
- Standard report guide
- End user training manual
- Trainer's manual
- Task specific tutorials

Future Training Format

- Hands-on
- Task and user role specific
  - Data entry
  - Investigator
  - Help desk
  - Administrator
  - Surveillance

Future Training Format Cont'd

- Train some staff in-house at DHSS as pilot
- Train the trainers
- Trainers train remaining DHSS staff
- Train end users
- Develop distance education material for technically proficient users
- Pilot and test all components and incorporate user feedback

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